Canadian Industry Report of

Fisheries and Aquatic Sciences No. 137

December 1982

EXPLORATORY GRAND BANKS SCALLOP SURVEY - 1982

by

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PREFACE

This study resulted from the submission of a proposal to the Department of Supply and Services. Funding to carry out the project was provided jointly by that Department and the Department of Fisheries and Oceans. Mr. W.G. Caudle acted as Science Procurement Manager on behalf of DSS while Project Managers for DFO were Gerry Brothers, St. John's and David Lemon, Halifax.

A complete biological analysis and assessment is presently being conducted by DFO staff and will be available shortly.

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Cat. No. Fs 97-14/137 ISSN 0706-6473

Correct citation for the publication:

Rodger, R.W. and N.D. Davis. 1982. Exploratory Grand Banks Scallop Survey - 1982. Can. Ind. Rep. Fish. Aquat. Sci. 137: iv + 29 p

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ABSTRACT

Rodger, R.W. and N.D. Davis. 1982. Exploratory Grand Banks Scallop Survey - 1982. Can. Ind. Rep. Fish. Aquat. Sci. 137: iv + 29 p

The Canadian offshore scallop industry, estimated at $100 million landed value in 1981, is experiencing productivity problems caused by the reduction of traditional fishing grounds, declining catch rates and higher costs. In an effort to alleviate the situation, The Fisheries Development Branch in St. John's and Halifax of the Department of Fisheries and Oceans, in conjunction with the Department of Supply and Services sponsored a survey to explore the Grand Banks of Newfoundland for new scallop beds. The survey parties discovered two areas of Iceland scallops on the central portion of the Grand Banks; however, the actual size of the areas must still be delineated. Other parts of the Grand Banks yielded concentrations of scallop which were relatively minor.

RESUME

Rodger, R.W. et N.D. Davis. 1982. Etude exploratrice des petoncles sur les Grand bancs - 1982. Rapport can. ind. sci. halieut. aquat. 137: iv + 29 p

L'industrie hauturière canadienne du pétoncle, dont les débarquements de 1981 sont estimés à $100,000,000, connaît actuellement une période de productivité difficile du fait de la diminution des aires de pêche traditionelle, de taux de prises décroissant et de coûts plus élevés, afin de soulager cette situation, la Direction du développement des pêches de Saint-John's et d'Halifax, du ministère des Pêches et des Oceans, en collaboration avec le ministère des Approvisionnements et Services, a commandité une étude exploratoire des nouveaux gisements de pétoncles sur les Grands bancs de Terre-Neuve. Les équipes d'études ont ainsi découvert deux zones de pétoncles d'Islande dans la partie centrale des Grand bancs; cependant, la dimension courante de ces zones doit être encore mieux definies. D'autres parties des Grand bancs soutiennent, par ailleurs, des concentrations de pétoncles qui sont relativement moins importantes.

Introduction

The giant scallop (Placopecten magellanicus) industry is the most valuable fishery in the Maritime region of Canada, estimated at $100,000,000.00 (one hundred million dollars) in 1981. (Fisheries Statistics Branch, Fisheries and Oceans, Canada). Since the offshore scallop fleet is experiencing difficulty in maintaining seasonable levels of landings from Georges Bank, the scallop industry is eager to find new commercial grounds.

The Iceland scallop (Chlamys islandica) supports an inshore fishery in the Northeastern Gulf of St. Lawrence and is known to be distributed on the Grand Banks of Newfoundland. (Dickie and Chaisson 1955). The general purpose of this study was to conduct an exploratory survey on the Grand Banks (NAFO division 3L, 3N and 30) to determine the distribution and abundance of Iceland scallops, and specifically, to delineate concentrations of scallops.

To conduct the survey, two commercial scallop draggers from the Georges Bank fleet were chartered during July and August 1982. The M.V. Charlotte Louise is a 116-foot wooden vessel skippered by Allen Skinner; during the survey the crew numbered thirteen. (The normal fishing contingent is seventeen). The M.V. Charlotte and Ricky is a 110-foot vessel skippered by Paul Allen; with the same crew complement as the other vessel. These vessels were selected because of the vast experience in scallop fishing held by both masters, and their keen interest in finding a new resource. Both vessels were equipped for dragging either one or two offshore 'New Bedford' scallop rakes.

Although 15-foot rakes are normally used by these vessels during commercial fishing, 13-foot rakes were used throughout this study, because the smaller rake was considered as a base-line size which any vessel in the fleet could tow.

These rakes consisted of 3" metal rings interconnected variously with 2, 3 or 4 links during different periods of the study. Both vessels were equipped with navigational gear including Loran-C and Decca receivers, Loran-C and satellite receiver-computers, radar, depth sounders, single side band and VHF radios. (See Appendix C for further vessel detail).

The areas explored during the survey were the middle portion of division 3L from 46^{o} to 48^{o} N Lat. and areas of 3N including the center of the bank, Southeast Shoal, Lilly Canyon and the Tail of the Bank. In addition, division 30 was explored in the areas of Whale Bank and Whale Deep with some fishing on the western portion of Green Bank. In order to determine selectivity characteristics of the rakes employed, tows were made in 3PS on St. Pierre Bank during the initial and final stages of the survey.

Two types of observations were recorded with set details and biological information. Set details comprised positioning and fishing effort information. The biological data recorded included catch weights and shell heights. As well, shell aging samples, and shell-height meat-weight samples were collected. The catch was exclusively Iceland scallops on all areas of the Grand Banks, while giant scallops did occur on St. Pierre Bank either in discrete beds, or mixed with Iceland scallops. Productive tows were defined as equal to, or greater than, 50 pounds (round weight)/rake-mile. Fifty pounds is approximately the weight of one bushel of scallops. One group of productive tows occurred approximately 25 miles east of the Virgin Rocks in division 3L in 38 to 40 fathoms of water, averaging 114 pounds (round weight)/rake-mile. (See Figure 1).

In general, Iceland scallops were present on the Grand Banks in relatively small quantity, i.e. less than 10 pounds (round weight)/rake-mile. Catches were usually made at depths from 30 to 50 fathoms. Areas of shallower depth were not extensively sampled and depths greater than 50 fathoms yielded even lower catches.

Iceland scallops were caught on both rock and sand substratum. There were two areas found to have substantially larger catches, ranging from 50 to 360 pounds (round weight)/rake-mile. Additional tows were made in an attempt to determine the size of the concentration.

Another area of abundance was found 35 miles south of the Virgin Rocks in division 3N in 36 to 40 fathoms of water, averaging 173 pounds (round weight)/rake-mile.

A cost analysis has been performed to determine the catch levels required to make fishing for scallops on the Grand Banks cost effective. Costs and zero-contribution level (i.e., breakeven level) of catch while fishing Georges Bank were first determined, then applied to a hypothetical season's fishing on the Grand Banks with a Nova Scotia base.

Breakeven was determined to occur at a catch level of 16,110 pounds/trip, which corresponds roughly to 126 pounds (round weight)/rake-mile. * That is, approximately 16,000 pounds of catch are needed to make the fishing operation pay for all expenses of the crew and vessel while at sea. However, this does not cover such shore-based expenses as engineers, tradesmen, office staff, and normal costs associated with land, buildings and equipment.

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* This assumes towing 2 rakes at 4 miles/hour, with the rakes on the bottom 40 minutes of the hour.

Summary

1. Two commercial scallop draggers, the M.V. Charlotte Louise and the M.V. Charlotte and Ricky were chartered for one month to perform an exploratory Iceland scallop survey on the Grand Banks of Newfoundland, July to August 1982.

2. The survey area included NAFO divisions 3L, 3N and 30.

3. The rakes towed during the study were 13-foot "New Bedford" offshore scallop rakes with 2, 3 and 4 link configurations.

4. Selectivity tows were made to estimate scallop retention (percentage), of rakes variously interconnected with 2, 3 and 4 links.

5. Considering the contribution of both vessels, 859 sets were completed, including 511 survey sets and 348 directed fishing sets. The total catch amounted to 25,267 pounds round weight, or 2,552 pounds meat weight (conversion factor - 9.78% (July), 10.22% (Aug.)).

6. Two major areas of Iceland scallop concentration were discovered in the central portion of the Grand Banks. These locations are estimated by the researchers to range in size altogether, somewhere between 200 to 600 square miles in total area. The density of scallop catches varied considerably in these areas.

7. In Area I, two areas of high potential were centered at the following locations:

   i) 49° 50' W 46° 30' N
   ii) 49° 40' W 46° 10' N

   Twenty-eight sets were made in this general area which averaged approximately 2¼ bushels per rake, per mile towed.

8. In Area II, north of the Southeast Shoal, an area of scallop with an approximate center located at 50° 20' W, 45° 30' N was discovered. Average catches, based on 26 sets, was 3½ bushels per rake, per mile towed.

9. Minor concentrations of scallop were found at other locations on the Grand Banks. The west central portion of the Bank (near Whale Deep), much of the northern section of the Bank, and areas around the Tail of the Bank were found to be almost wholly absent of scallop in the locations surveyed.

10. The optimal depth range for catching Iceland scallops in the areas studied was 36 to 40 fathoms.

11. The scallop beds tend to be comprised of older scallops heavily encrusted with barnacles and other epifauna.

12. Many areas of scallop may have been missed in the course of the survey due to the distances involved. Further study on the size and dimensions of areas found is necessary to fully appreciate their commercial significance.

1.0 FISHING OPERATIONS

1.1 Methodology

The survey plan was based on a sampling technique * which was modified to accomodate known or suspected areas of scallops. Approximately half of the (24 hour) day was spent towing at randomly plotted stations. The remaining time was used for directed fishing, where the skipper and observer team deviated from the planned survey route to further assess a promising bed or to try new areas.

Each occasion that one or both scallop rakes were fished constituted a survey set or tow number. ** Thus a survey set could either be done on "station" (i.e., on the survey plan) or during directed fishing. An effort was made to adjust vessel power, speed and time so that survey tows were kept to approximately 1 mile in length. This took some practice and, for various reasons, was not always accomplished.

Sounder paper recordings were also kept for all survey tows. Information on time of tow, direction of tow, sea and wind conditions, etc. was collected for all tows. Tow location was recorded from the best readings that could be obtained from Loran-C, Decca or Satnav receivers; or from a combination of the above if conditions necessitated.

The set duration was the elapsed time starting when the rake dug into the sea bottom (maximum warp) until the winch began winding the warp back onto the spool. After the rake was hauled back, the contents were emptied and any scallop catch was immediately sorted out. When the total catch was small (under a bushel),the shell height of all scallops was taken at all survey stations. When the catch was larger, it was often impossible to measure each animal before the next tow, so only a sample of the catch was selected for size measurements.

Weight measurements were taken on all scallop catches. When catches were small, actual weight was recorded. On larger catches there was only time to record the number of bushels caught. Trial measurements indicated that a weight of 48 lbs. to the bushel (round weight) was an acceptable conversion factor. No allowance was made for barnacles or other crustaceans on the scallop however, as this weight varied from place to place.

In addition to weighing and measuring the total catch (either directly, or through sampling procedures) records were also kept on the by-catch. Locations of crab, clam, sand dollars, starfish, sea cucumbers, etc. were noted as well as any comments that would further explain the catch results of the towing operation.

The data on each tow, for both vessels, is recorded in Appendix D. Appendix D, because of size, has been printed separately and can be obtained from the Department of Fisheries and Oceans at the address shown on the title page.

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* random stratified sampling (for further information see reference section).

** usually, it was only necessary to use one rake, thus reducing the chances of damage or loss of both rakes over the survey period.

In addition to the above, approximately 200 independent biological samples were obtained for laboratory analysis at the Department of Fisheries and Oceans, St. John's, Newfoundland. These samples were selected according to a very precise procedure in which 5 sample animals were chosen at a time (i.e., twenty altogether) to represent the range of sizes caught in a given scallop area. The adductor muscle was carefully shucked, ensuring that pieces of meat were not left on either shell. These meats were then frozen individually with information tags, for laboratory weight determination by Fisheries Research Branch personnel.

Survey Tows

Biological information was collected at survey stations so that data based on the random stratified sampling technique could be used to estimate the total scallop population and the total biomass (meat weight) on the Grand Banks. Thus, measurements on survey tows were carefully recorded, as were the biological data to accompany meat samples sent to St. John's for analysis. For example, careful attention was paid to the start and end of tow positions, tow distance, catch size and weight on survey station tows.

Directed Fishing Tows

In comparison to survey tows, fishing trials (directed fishing by captain and observer teams) were to explore new areas not planned on the survey, or to make additional tows in areas of abundance to determine the size of a bed. Since this data would not be further analysed, complete profiles were not recorded,(start, end and mean depth were recorded however) and towing distances were more variable, depending on the skipper's intuition.

As the survey progressed, it became apparent that directed fishing tows would not be productive in some areas (for example; if the water was too deep, or nearby areas had already been surveyed) so that directed fishing time was accumulated,as the survey stations were completed earlier than expected. This provided additional time to survey areas where scallops were found, and also to survey parts of the Southeast Shoal and The Tail of The Bank.

While many extra fishing trials were made in areas where scallop concentrations were found, it should be noted that overall, very little time was available for the vessels to stay in any one area. The survey route(s) covered a large portion of the Grand Banks and it was necessary to push on and finish the survey even when large catches of scallop were encountered in some areas. For this reason, the total scallop catch for the trip was lower than it might have been had the vessels maintained a fishing effort in more productive areas.

1.0 FISHING OPERATIONS

1.2 Vessel Itinerary

The M.V. Charlotte Louise and the M.V. Charlotte and Ricky departed Lunenburg, Nova Scotia on July 17, 1982. The two boats proceeded to Louisbourg together to pick up additional fuel. The M.V. Charlotte Louise continued on to the Grand Banks to commence the survey on July 19, while the M.V. Charlotte and Ricky stopped on St. Pierre Bank to make several selectivity tows. Figure 1 outlines the vessels' concise tracks.

On July 21, the M.V. Charlotte and Ricky commenced towing at survey stations in division 3L. These stations were in depth strata of 30 to 100 fathoms. After finishing the required survey sets the M.V. Charlotte and Ricky came into St. St. John's, Newfoundland on July 28, a few days earlier than expected due to failure of the auxiliary engine. The M.V. Charlotte Louise joined the other dragger in St. John's on July 30.

After the first phase of the trip was evaluated, a decision was made to cancel the remaining sets planned for sub area 3L because of poor catches.

A plan was then prepared which concentrated on sub areas 3N and 30 for the second phase of the project.

These positions were selected in consultation with the captains regarding locations where they thought scallops would be found and where the type of bottom seemed likely to produce scallop catches. The optimal depth chosen for fishing scallops was determined at 30 to 50 fathoms.

The vessels departed St. John's together on August 1, and resumed fishing operations within 12 hours of departure. The M.V. Charlotte Louise completed the survey on August 13, steamed to St. Pierre Bank where a few hours of fishing tows were made, and proceeded on to Lunenburg where it arrived on August 15.

The M.V. Charlotte and Ricky steamed back to St. John's on August 7, resumed fishing by August 11, and completed all stations by August 13. Additional fishing was conducted on Green Bank and several selectivity tows on St. Pierre Bank were also completed. The vessel made port in Lunenburg on August 18.

The total number of sets completed by both vessels was 859 (Table 1). The number of survey stations successfully completed by both vessels was 496, not including inverted rakes or repeated stations. * The number of fishing trials represents the number of directed trials which were completed. The total catch is the sum of the total (pounds round weight) from Appendix D. In tows where the catch was less than 2 pounds, 1 pound was used to compute the contribution of that tow towards the total catch.

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* A 'set' refers to an individual towing trial using either one or two rakes while a 'station' refers to a towing area where one or more sets may be made.

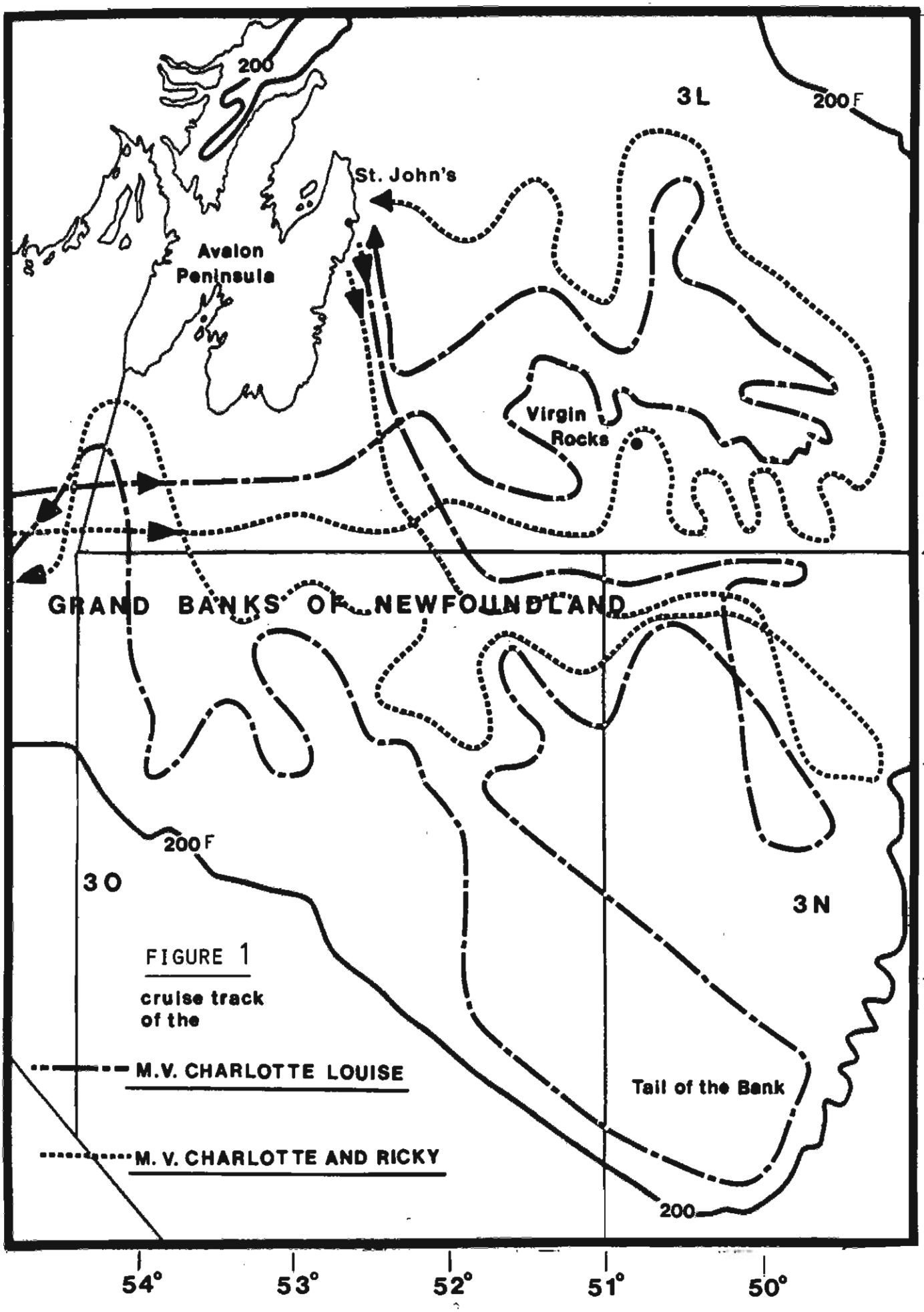

FIGURE 1

cruise track
of the

M.V. CHARLOTTE LOUISE

M. V. CHARLOTTE AND RICKY

TABLE 1

Sets completed and Iceland scallop catch for the M.V. Charlotte Louise and the M.V. Charlotte and Ricky July 17 to August 18, 1982 on the Grand Banks of Newfoundland.

	# of sets	# of survey sets	# of fishing trial sets	catch round wt. (pounds)	Meat wt. (pounds) *
M.V. Charlotte Louise	526	250	276	18,116	1,822
M.V. Charlotte and Ricky	333	261	72	7,151	730 **
	859	511	348	25,267	2,552

* factors used to convert round weight to meat weight are 9.78 (July) and 10.22 (August), (Naidu 1982).

Note: Since considerable marine growth was found on shells on the Grand Banks in comparison to that found on the Strait of Belle Isle, this conversion factor may overstate actual meat weights.

** M.V. Charlotte and Ricky landed an additional 1,958 pounds (round weight) while conducting selectivity trials on St. Pierre Bank.

2.0 POTENTIAL SCALLOP BEDS

2.1 Significant Areas of Scallop Concentration

Each area encountered on the survey where scallop catches were greater than 50 pounds (round weight)/rake-mile is represented in Figure 2. (This represents a catch of 1 bushel of scallops, in each rake, for every mile towed). All catches were of the Iceland scallop variety. Only a few dead sea scallop shells were found on the Grand Banks. These were presumed to have washed out in the tide from coastal areas, or to have been dropped after shucking, from other vessels.

As represented in Figure 2, there were several areas where catches were greater than 1 bushel/rake-mile (note: illustrated areas are not to scale). Table 2 presents the average weight of the scallop catch per area based on the number of catches over 50 lbs./ rake-mile in that area.

As can be noticed in the diagram, there appears to be a concentration of high catches in the areas labelled Area I and Area II. Area I was actually found to be composed of two smaller beds which tended to overlap each other. The largest catch of the trip, approximately 7 bushels per rake; was recorded in the northern section of Area I at 49° 57' W and 46° 28' N. This concentration of scallop carries eastward (90° magnetic) over a distance of about 10 miles. However, this scallop area has not been fully determined.

About 5 miles directly south (180° magnetic) of this scallop concentration, another concentration of scallop was encountered in the same area, which seemed to extend a distance of at least 20 miles further south. In between the north and south concentrations in Area I very few scallops were discovered in this survey; however, only a few trials were made. Scallop in Area I (both concentrations) were often noted to be found in pockets, rather that in a continuous population. Scallops in the southern section of Area I also appeared to be in less dense groupings than in the northern section.

Overall, 28 sets were made in this area with an average catch of 114 pounds of scallop/rake-mile (i.e., about 2¼ bushels/ rake).

In comparison to Area I, Area II seemed to have a relatively consistent concentration of scallop catch; starting from 50° 30' W/45° 22' N and running in a north-easterly direction (50° magnetic) over a distance of approximately 20 miles. This scallop area is believed to be at least 10 miles in depth through part of its length. While the full extent of the area has not been determined, 26 sets at this location produced average catches of 173 lbs./ rake-mile (i.e., about 3½ bushels for each rake, per mile towed). See Appendix A for further description of findings.

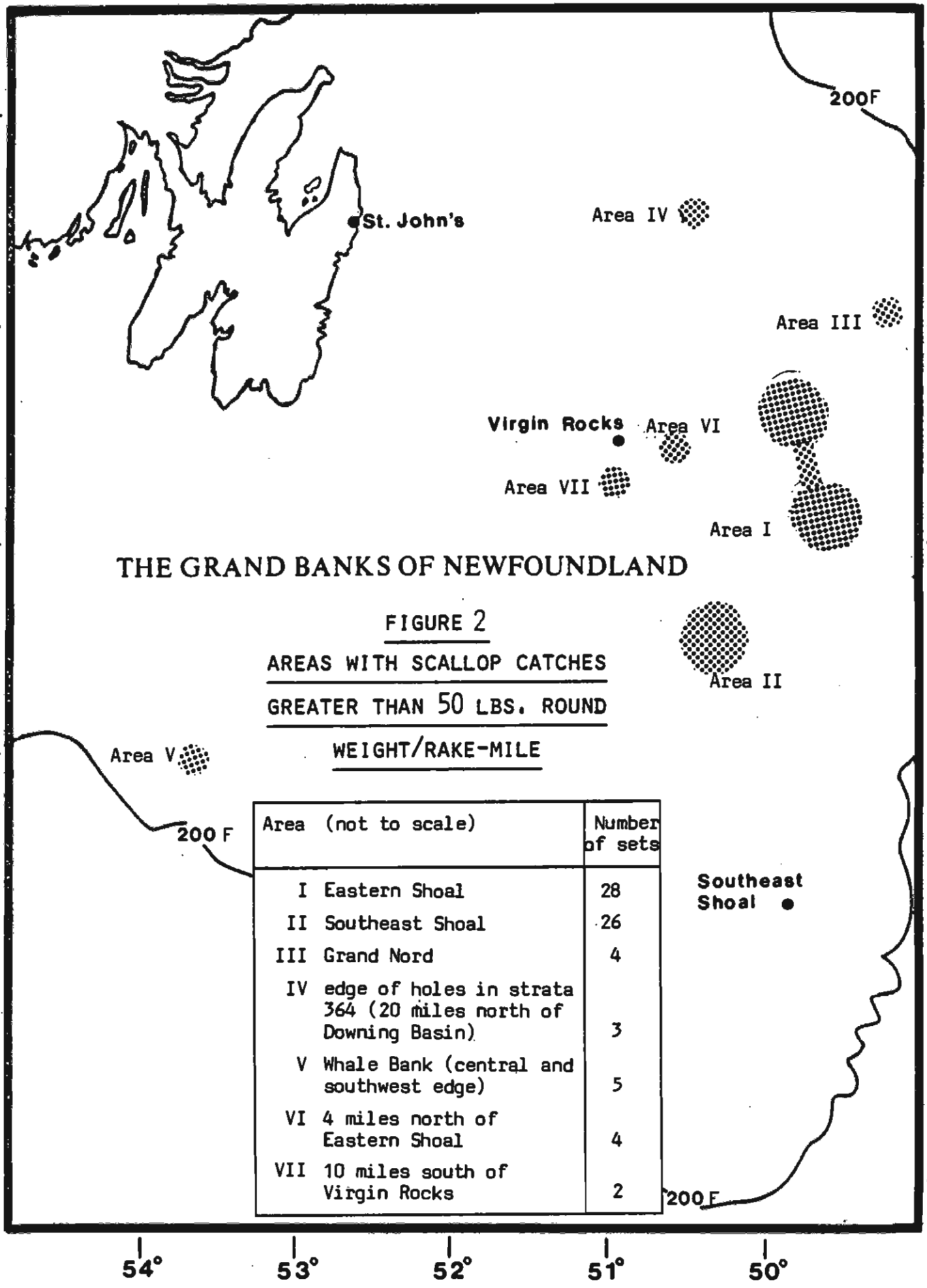

FIGURE 2

AREAS WITH SCALLOP CATCHES GREATER THAN 50 LBS. ROUND WEIGHT/RAKE-MILE

Area (not to scale)		Number of sets
I	Eastern Shoal	28
II	Southeast Shoal	26
III	Grand Nord	4
IV	edge of holes in strata 364 (20 miles north of Downing Basin)	3
V	Whale Bank (central and southwest edge)	5
VI	4 miles north of Eastern Shoal	4
VII	10 miles south of Virgin Rocks	2

TABLE 2

Concentration greater than 50 pound (round weight)/rake-mile of Iceland scallops caught in relation to frequency of sets, catches and depth of water.

Area	Number of sets	Total Catch lbs. (round wt.) per rake mile	Avg. Catch lbs. (round wt.) per rake mile	Average Depth fathoms
Eastern Shoal	28	3,201	114	38
Southeast Shoal	26	4,493	173	40
Grand Nord	4	408	102	48
edge of holes in strata 364 (20 miles north of Downing Basin)	3	399	133	61
Whale Bank (central and southwest edge)	5	364	73	42
4 miles north of Eastern Shoal	4	342	86	45
10 miles south of Virgin Rocks	2	188	94	45

2.0 POTENTIAL SCALLOP BEDS

2.2 Quality Considerations Concerning the Iceland Scallop

The quality of Iceland scallops landed during the survey varied according to three main factors:

1) meat size
2) firmness and texture of the meats, and
3) the amount and type of growth on the shells (eg. barnacles).

Iceland scallops were found to vary in meat counts (per pound) from about 30 (on St. Pierre Bank) to 80 or more in other locations. Some areas of catch seemed to have older scallops as evidenced by the number of barnacles and other growths on the outer shells. These barnacle-ridden scallops frequently yielded soft, stringy meats. In some cases meats were almost jelly-like and had to be thrown out. Brothers (1976) noted similarly encrusted scallops with soft, stringy meats along the Labrador coast.

In other survey areas scallops encountered were clean-shelled and appeared very healthy, with meat counts often in the 40 - 50 range. The size, firmness and texture of the meats from clean-shelled scallops was preferable, on the whole, to meat from scallops with barnacles or other crustacean growth on the shell.

Healthier scallops are believed by the researchers to be more frequently found around the outer edges of scallop concentrations.

The central areas of potential scallop beds appeared to consist of scallops which were older and in more general decay. However, since barnacle-ridden scallops were usually small, and also since few dead shells were found in the middle of scallop concentrations, it has also been suggested that poor feed may be contributing to the lack of quality in the meats. Thus meat quality may be dependent on both age and feed factors.

Captain Allen and Captain Skinner were both of the opinion that repeated dragging of the scallop areas would "stir up the feed" and probably contribute to healthier scallops. Indeed, it was pointed out that on St. Pierre Bank, Iceland scallop quality appears to have improved greatly over the years since they were first fished. Vessels returning to St. Pierre Bank after a 8 or 10 year absence described the quality of catch as excellent, with meat counts often in the 30 range. Squires (1962) has noted that beds tended to be improved by occasional fishing to remove old scallops. Thus, it is suggested that future fishing efforts will improve the meat qualities of the scallop areas presently discovered on the Grand Banks.

The taste and flavour of Iceland scallops appears to be comparable with the sea scallop and visually it is difficult, if not impossible to tell them apart. Occasionally, Iceland scallops on The Grand Banks were noticed to have a slightly pinkish colouring, and may have been sweeter to the taste, than sea scallops. Iceland scallops did not seem to store as well on ice as sea scallops; however, this observation requires further confirmation.

3.0 COMMERCIAL POTENTIAL FOR A GRAND BANKS SCALLOP FISHERY

3.1 Cost - Volume - Profit Analysis

Several assumptions have been made in this analysis. The Eastern Canadian offshore scallop fleet was assumed to be based in Nova Scotia, although this might not be the case for a Grand Banks fishery. Basing the present fleet in Newfoundland would produce a greater gross profit margin, but the arrangements made between the owner and the ship's company would produce other expenses (eg. travel) which could only be approximated in this study.

Additionally, no effort was made to assess the feasibility of a "mixed" (Georges and Grand Banks) fishery. The decision as to when to fish Georges and when to fish the Grand Banks would depend upon the volumes of catch available at each location. (An accurate decision on which Bank to fish could probably be determined if processors utilized cost-volume-profit models for their operations).

The allocation of revenue and expenses from a typical scallop catch is outlined in Table 3. Tables 4 and 5 show the annual direct fishing, vessel and general expenses applicable to the Georges Bank (Table 4) and a Grand Bank (Table 5) fishery. These tables illustrate a vessel's contribution to the costs and expenses of a shore facility.

From the contribution margin, (Table 4),.the owner must pay for running a shore facility (the cost of which will vary according to the operation's size). This includes shore engineers, tradesmen, office staff, and all normal costs associated with land, buildings and equipment, supplies, utilities, etcetera. Depreciation does not enter into the equation due to the age of the current fleet.

The landed value of scallops in Nova Scotia as of Sept. 23, 1982 was $3.80/pound. Capt. Paul Allen has estimated that at this price, the minimum average catch at which a vessel can fish Georges Bank is approximately 12,000 pounds per trip. Based on the calculations presented in Table 3, the contribution margin (Table 4) equals zero at an average catch of 12,295 pounds per trip. See Figure 3 for an illustration of profit and loss at various catch levels.

Captain Allen has suggested that the average number of trips which a Nova Scotian vessel could make to the Grand Banks would decline to 12 from the present 16 trips to Georges Bank. This is due to the three days' extra steaming involved (average time to Central Grand Banks), and climatic differences.

The illustration indicates that zero-contribution for a twelve-trip year fishing the Grand Banks from Southern Nova Scotia will be achieved at a catch level of 16,110 pounds per trip. *

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* For purposes of this analysis zero-contribution can be considered as the breakeven level at which all expenses for ship and crew are paid by fishing revenues.

Zero-contribution is not a desirable situation for a profit-oriented enterprise to be in, especially when the overhead costs involved in running a shore facility have not been considered. Therefore, it is concluded that the minimum average catch level (at present prices and expense levels) in which a Nova Scotia fleet could exploit the Grand Banks would be about 17,000 pounds. Even at this level, strict paring of expenses would be required.

A further consideration is that vessel replacement at zero-contribution would be difficult.

However, zero-contribution level is affected by both the supply of scallop, and the price. If price continues to rise, as it is doing now, then the breakeven catch level will drop. This is likely to happen if markets remain firm, and North American supplies continue to decline, which appears to be the case.

The price of $3.80 appears reasonable as it reflects a relatively average price over the last two years. However, it is quite possible that prices could remain high as supply dwindles. There is no difference in the landed price (per pound) of sea scallops and Iceland scallops in Nova Scotia at the time of writing.

TABLE 3

A TYPICAL ALLOCATION OF REVENUE SCHEME
FOR SCALLOP FISHING

GROSS REVENUE

LESS: Captain's Commission (5½%)
First Mate's Commission (1%)
Chief Engineer's Wages ($15.00/day)
Fuel and Lubricants
Ice and Scallop Bags

YIELDS: REVENUE TO BE SPLIT

FISHERMEN'S SHARE 60%	COMPANY'S SHARE 40%
LESS: Provisions Cook's Wages - ($8.00/day) 2nd Engineer's Wages - ($5.00/day)	LESS: Fishing Supplies Maintenance Compensation Insurance Sundry Chief Engineer's Share
YIELDS: Amount divided by the number of crew to give value of one share, the basic deck-hand's earnings. The Chief Engineer's share is paid by the owner, and the master receives two shares. Typical crew is fifteen or sixteen. (Throughout the analysis, fifteen crew members are assumed).	YIELDS: Contribution Margin, from which the shore facility operates.

TABLE 4

ASSUMED REVENUE AND TYPICAL CURRENT EXPENSES, GEORGES BANK FROM NOVA SCOTIA (16 TWELVE DAY TRIPS PER ANNUM)

ASSUMED GROSS REVENUE (1)		1,216,000
DIRECT FISHING EXPENSES		
Captain and Crew (2)	656,560	
Ice and Bags	4,750	
Provisions	25,000	
Fuels and Lubricants (3)	190,000	
Fishing Supplies	37,500	
Compensation & Benefits	9,500	
Total Fishing Expenses		923,310
GROSS PROFIT		292,690
VESSEL AND GENERAL EXPENSES		
Repairs and Maintenance (4)	90,000	
Insurance (5)	40,000	
Sundry	5,000	
Total Vessel and General Expenses		135,000
CONTRIBUTION MARGIN (SALES MINUS VARIABLE EXPENSES)		$ 157,690

TABLE 5

ASSUMED REVENUE AND TYPICAL CURRENT EXPENSES, GRAND BANKS FROM NOVA SCOTIA (12 FIFTEEN DAY TRIPS PER ANNUM)

ASSUMED GROSS REVENUE (1)		$ 912,000
DIRECT FISHING EXPENSES		
Captain and Crew (2)	464,010	
Ice and Bags	4,750	
Provisions	23,640	
Fuels and Lubricants (3)	177,900	
Fishing Supplies	37,500	
Compensation	9,500	
Total Fishing Expenses		717,300
GROSS PROFIT		194,700
VESSEL & GENERAL EXPENSES		
Repairs and Maintenance (4)	90,000	
Insurance (5)	40,000	
Sundry	5,000	
Total Vessel and General Expenses		135,000
CONTRIBUTION MARGIN		$ 59,700

NOTES TO TABLES 4 & 5

Typical current expenses for Nova Scotian scallop vessel fishing Georges Bank. *

1. Assumed gross revenue is derived from an average catch of 20,000 pounds at a price of $3.80/pound sea scallops (price as of September 23, 1982). **

2. The actual computation involved is quite complex. It is outlined in Appendix A in the manner in which the vessels chartered are accustomed to performing it. The figure is the total of all shares, commissions and wages.

3. Fuel consumption is taken at a rate of 30 gallons/hour, and priced at the September 23, 1982 rate of $1.42/gallon.

4. This applies to an average steel vessel. Maintaining a wooden vessel is considered to be more expensive by perhaps 15% (or more, depending on the vessel's age).

5. Although it is not strictly a variable expense, insurance has been included in arriving at the contribution margin because it is clearly a vessel expense.

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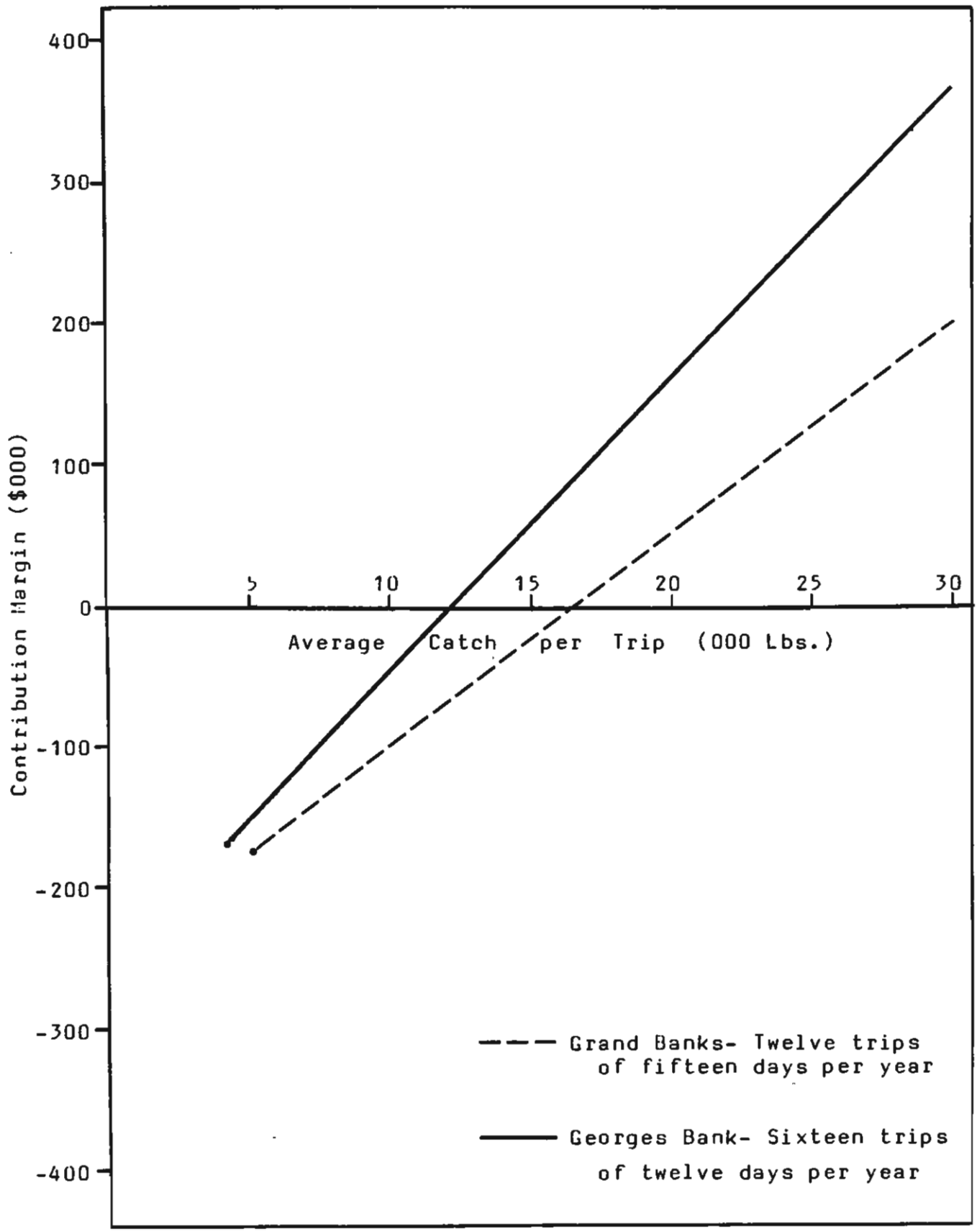
* Adapted from D. Knickle "Feasibility of Replacing the Nova Scotian Offshore Scallop Fleet;, M.B.A. Thesis in Progress, St. Mary's University 1982, with Capt. Paul Allen's corroboration.

** Iceland scallops could market at a lower value.

FIGURE 3

Volume-Contribution Margin Curves for
Georges Bank and Grand Banks Fisheries



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APPENDIX A

OTHER FINDINGS ON THE GRAND BANKS

Several smaller areas were found where scallop concentrations were greater than 50 pounds (round weight)/rake-mile (see Figure 2). These included areas generally located as follows:

	General Area	Approximate Location
Area III	Grand Nord	49° 00'W 47° 10'N
Area IV	Edge of holes (strata 364)	50° 30'W 47° 25'N
Area V	Whale Bank	54° 03'W 45° 00'N
Area IV	4 miles north of Eastern Shoal	50° 30'W 46° 30'N
Area VII	10 miles south of Virgin Rocks	50° 50'W 46° 15'N

The Whale Bank area, in particular, seemed to have a widespread area of low but perhaps promising scallop concentrations. It is possible that larger concentrations might be found in small pockets across the southeastern portion of the Bank.

Iceland scallops were found widely distributed over the Grand Bank but usually in very small concentrations. In some areas there were no scallops. Tows in deeper waters in the northern portion of the bank (above 47°N) generally yielded little evidence of scallops. Large rocks, and occasional queen crabs and basket stars were the normal catch. The same type of catch was found in tows made 30 to 40 miles west of the Placentia Channel. Rocks were the common catch in the Whale Deep area, with very little other life forms.

Tows made in the southern part of the bank were almost entirely absent of scallops, but the bottom profile and fauna were quite different than in the northern part. Crabs, small clams and shells, sea stars, sea cucumbers and sand dollars were found in abundance around the northern portion of the Southeast Shoal area. Brittle stars were very common around the Tail of the Bank along with sea stars, and clam shells in some areas.

APPENDIX B

VESSELS AND GEAR

The two vessels chartered from C.W. MacLeod Fisheries Ltd. were typical wooden scallopers, (shown in cross-section in Figure 4). The vessels were constructed in the early 1960's by Smith and Rhuland, of Lunenburg, Nova Scotia, and have the following specifications:

Charlotte Louise - Overall length of 114 feet, with a beam of 23 feet, powered by a ten-cylinder Fairbanks two-cycle diesel engine which produces approx. 800 horsepower. Navigation gear aboard consisted of one Sat Nav. receiver-computer, one Decca receiver, one Loran-C receiver, one Loran-C receiver, one Loran-C computer, two Loran-C receiver-computers, two Radars, two Depth Sounders, one magnetic compass and autopilot, and Single Side Band and VHF radios.

Charlotte and Ricky - Overall length of 110 feet with a beam of 23 feet. She is powered by a six-cylinder Deutz 536 four-cycle diesel engine which produces approximately 650 horsepower. Navigation gear aboard was the same as that aboard the Charlotte Louise, with one additional magnetic compass and auto-pilot.

Both vessels are fully equipped for fishing with two offshore rakes, normally towing at a speed of approximately 4 knots, with a cruising speed of 10 knots. The rakes were 13-foot New Bedford type dredges (shown in Figure 6), of the sort normally used by the Canadian fleet.

The scallop mesh is composed of 3" steel rings interconnected by split links (Fig. 5). The number of links determines the size of the interlink space in the rake. The link configurations used during the survey are listed in Table 2. The links used on the bottom of the rake comprise that portion which is in direct contact with the sea floor during dragging. Links interconnected on the top of the rake comprise the portion between the rope-back and the club stick (see Fig. 6).

Both vessels commenced the survey towing a rake consisting of 2 links (on bottom) and 2 links (on top). The M.V. Charlotte Louise later towed a 4 link (on bottom) and 2 link (on top) arrangement because it was believed the rake needed more mesh strength to hold large boulders. Later, the M.V. Charlotte Louise decided on a 4 link and 3 link rake configuration; this arrangement is normally used in commercial fishing for giant scallops on Georges Bank.

The M.V. Charlotte and Ricky towed a 2 link (bottom and top) rake throughout the first part of the survey based on the results of the selectivity study. However, during the second trip the 4 link and 3 link configuration was used. Following the completion of the survey by the M.V. Charlotte and Ricky, selectivity tows were made to determine the percent of retention from this commercial link configuration. No attempt has been made in this report to compare or interpret the catch rates between rakes of various link configurations.

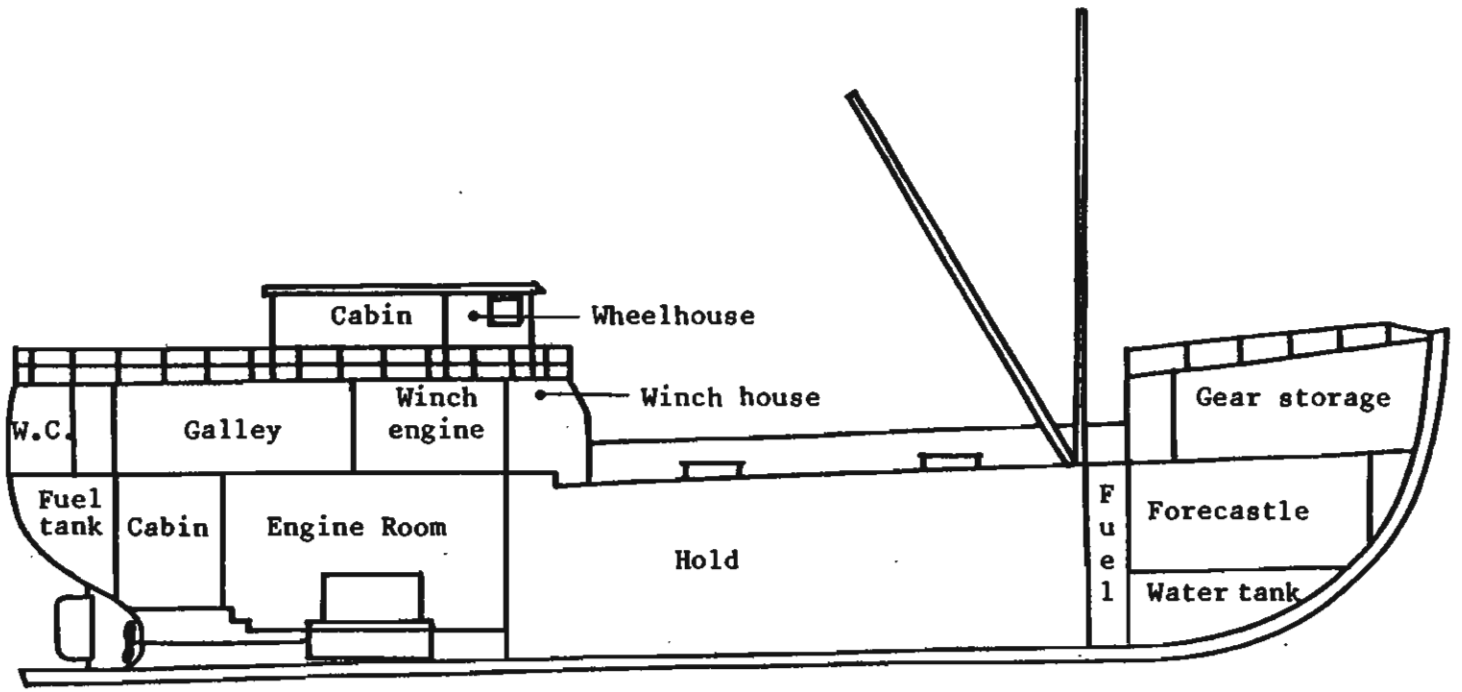
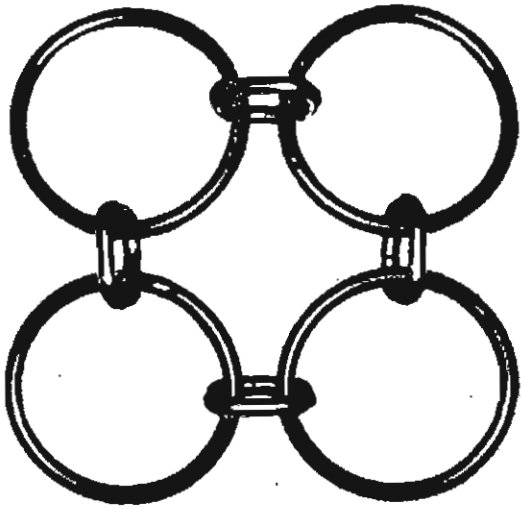


FIGURE 4

SCHEMATIC CROSS-SECTION OF A TYPICAL SCALLOP DRAGGER OF THE 110 FOOT CLASS

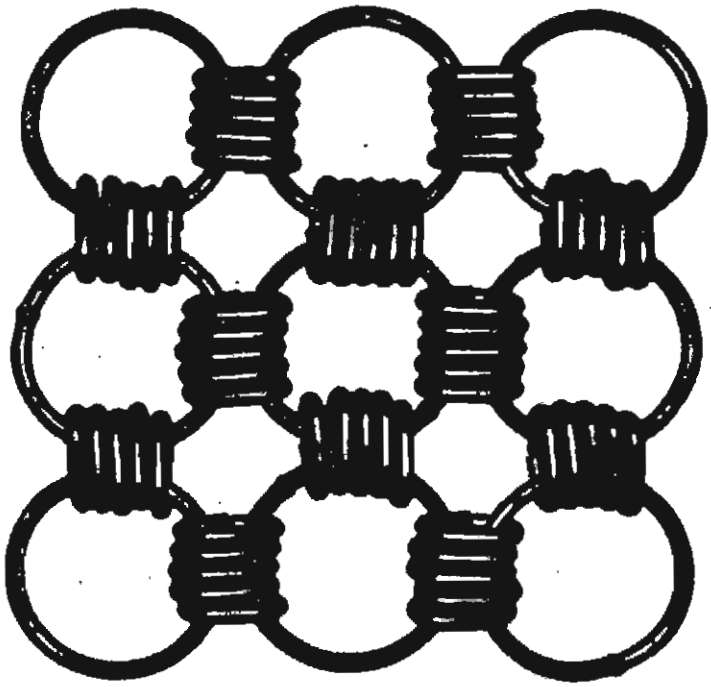
FIGURE 5

TWO DIFFERENT RING - LINK CONFIGURATIONS



RINGS JOINED BY
SINGLE SPLIT LINKS

OPEN SPLIT LINKS

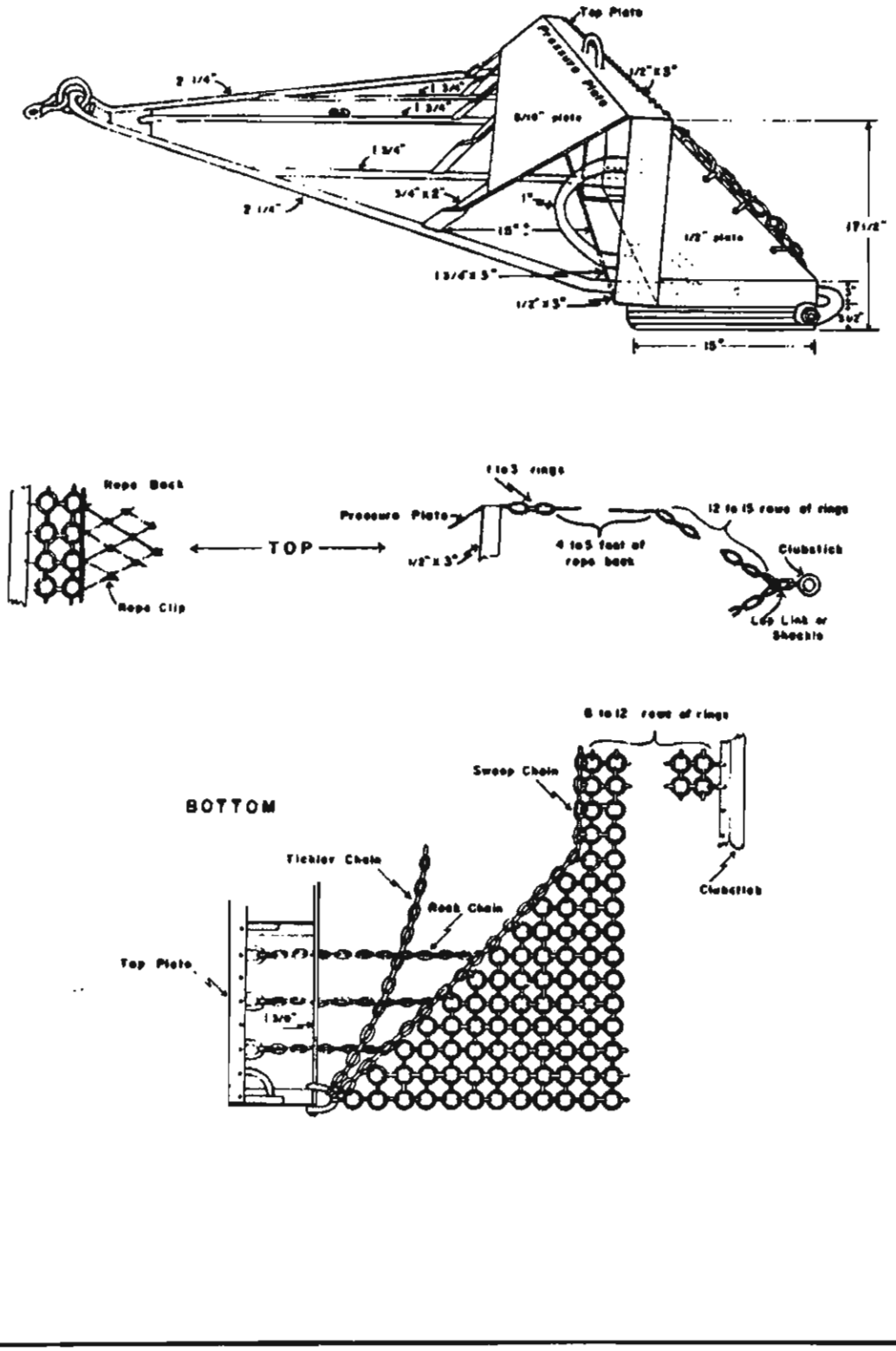


RINGS JOINED BY
FIVE SPLIT LINKS

FIGURE 6

DETAILS OF A TYPICAL

OFFSHORE SCALLOP RAKE



APPENDIX C

SELECTIVITY TRIALS

In an attempt to determine the retention characteristics of the scallop rakes used in this survey, paired tows were made comparing the catches in a lined (1½" shrimp mesh) and unlined rake. Shell height measurements were made on the whole catch, keeping catches from the two rakes separate. The percent retention of the size classes represented in the unlined rake can be calculated by assuming that there is little or no escapement from the lined rake (retention = 100%).

The original plan called for comparing the percent retention of four different rake-link configurations, those interconnected with either 2, 3, 4, or 5 links. When the M.V. Charlotte and Ricky made selectivity tows on St. Pierre Bank on July 19 and 20, delays due to rough weather, and the problem in locating a suitable scallop bed resulted in only two out of four of the originally planned configurations being completed.

After successfully completing tows using 2 and 3 link rakes, it was decided that time constraints prohibited further selectivity trials on 4 and 5 link configurations.

The percent retention of the 2 link and 3 link rakes were evaluated using the following criteria:

(a) 50% retention of shell heights should approach 70mm in the unlined rake.

(b) a broad spectrum of size classes should be represented in the unlined rake.

(c) selection of larger size classes should be similar in lined and unlined rakes.

On this basis, Frank Cahill (Resource Branch, Fisheries and Oceans, St. John's) evaluated the 2 link rake as the best for fulfilling these criteria and recommended that it be used on survey tows.

However, since the 4 link rake is the commercial configuration, it was decided that in the second half of the trip selectivity trials be made on 4 links as well. These tows were made on St. Pierre Bank on Aug. 14 and Aug. 15. The results were left with Frank Cahill and Sam Naidu (Resource Branch, Fisheries and Oceans, St. John's, Newfoundland) to be used in adjusting biomass estimates.

TABLE 6

The scallop rake link configurations used by the M.V. Charlotte Louise and the M.V. Charlotte and Ricky.

Vessel Name	Dates Employed	Rake-Link Configuration Bottom *	Rake-Link Configuration Top *
M.V. Charlotte Louise	July 19	2 links	2 links
	July 19 - 22	4 links	2 links
	July 22 - 24	2 links	2 links
		4 links	2 links
	July 24 - 25	2 links	2 links
		4 links	3 links
	July 25 - Aug. 13	4 links	3 links
M.V. Charlotte and Ricky	July 21 - 28	2 links	2 links
	Aug. 2 - 16	4 links	3 links

* explained in text

APPENDIX D

TOWING INFORMATION ON THE SURVEY SETS COMPLETED
DURING THE 1982 GRAND BANKS SCALLOP SURVEY
FOR THE M.V. CHARLOTTE LOUISE
AND THE
M.V. CHARLOTTE AND RICKY

Appendix D, because of size, has been printed separately and can be obtained from the Department of Fisheries and Oceans at the address shown on the title page.

ACKNOWLEDGEMENTS

The researchers wish to express their thanks to Captains Paul Allen and Allan Skinner and to their crews for their cooperation and valuable sharing of experience throughout the duration of the cruise.

Thanks as well to Bud MacLeod of C.W. MacLeod Fisheries for supplying two vessels and giving his greatest cooperation toward the success of the project.

Thanks are also due to the personnel of the Department of Fisheries and Oceans, particularly Sam Naidu, David Lemon and Gerry Brothers, and the Department of Supply and Services, especially Bill Caudle; for their understanding and concern for the problems facing the offshore scallop industry.

We also wish to acknowledge the invaluable assistance and excellent support of Mike Eaton of the Bedford Institute of Oceanography.

For the fortitude they displayed at the time of the loss of their comrade Howard March, Captain Allen and the crew of the M.V. Charlotte and Ricky have our deepest gratitude and admiration.

The writers of this report wish to thank Richard Vinson and Alan MacLean for their valuable suggestions and contributions to the report, and to the project.

APPENDIX D

TOWING INFORMATION ON THE SURVEY SETS COMPLETED DURING THE 1982 GRAND BANKS SCALLOP SURVEY FOR THE M.V. CHARLOTTE LOUISE AND THE M.V. CHARLOTTE AND RICKY

Canadian Industry Report of
Fisheries and Aquatic Sciences No. 137

December 1982

EXPLORATORY GRAND BANKS SCALLOP
SURVEY - 1982

by

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Notes on Appendix D

Tow (also termed set) - Refers to the towing trial being conducted, with either one or two rakes in use.

Station - Refers to a pre-plotted location on the survey.

Fishing Trial - A location where a tow(s) was made which was not pre-plotted, or planned, for the survey. (i.e. a trial directed by the captain or survey team).

Scallop Catch - Measured in round weight (pounds) per rake per mile towed. When distance towed was greater or less than 1 mile and/or if more than 1 rake was used, the result was averaged. Absolute catch, and distance towed, should be noted for all scallop catch readings in rake/miles.

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
1	127		593X 14253 593Y 25580	593X 14252 593Y 25568	125	60	16	1.50	rock	<2	2	0		
2	121		593X 14215 593Y 25617	593X 14221 593Y 25616	245	70	15	1.00	rock	0	2	0		
3	134													set abandoned not enough warp
4	129		593X 14206 593Y 25506	593X 14204 593Y 25502	180	79	17	1.25	rock	0	1	0		rake saturated
5	140		593X 14192 593Y 25529	593X 14187 593Y 25534	217	83	15	1.50	rock	<2	1	0		
6	123		46°15'05"N 53°54'44"W	46°14'49"N 53°56'33"W	280	88	20	1.25		<2	1	0	crabs	
7	128		593X 14252 593Y 25415	593X 14257 593Y 25416	10	62	18	1.00	rock	<2	1	0	sea stars	
8	128		593X 14268 593Y 25420	593X 14267 593Y 25382	120	62	25	1.50	rock	0	1	0		
9	124		46°25'40"N 53°45'30" W	46°24'53"N 53°43'20" W	120	50	16	1.25	rock	2	1	2		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW		DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
			START	END										
19	152		593X 14225 593Y 25071	593X 14226 593Y 25067	105	87	18	1.25	rock	0	1	0	queen crabs	
20	143		593X 14254 593Y 25040	593X 14255 593Y 25037	116	108	23	1.50	rock sand	0	1	0	sand dollars crabs basket stars	
21	162		593X 14260 593Y 25013	593X 14253 593Y 25010	10	108	19	1.25	rock	0	1	0	queen crabs basket stars	moved away from original location because of crab traps
22	149		46°38'35"N 52°20'08"N	46°39'59"N 52°15'38"N	275	107	17	1.00		0	1	0		navigational error set repeated
23	149		46°39'21"N 52°26'78"W	46°39'24"N 52°25'33"W	30	81	20	1.25	sand	0	1	0	queen crabs sand dollars	Loran-C erratic, used satellite navigation
24	153		46°48'36"N 52°10'70"W	46°48'37"N 52°08'51"W	67	67	20	1.25	rock	< 2	1	0	sea stars flounder	
25	159		46°47'80"N 52°00'93"W	46°46'55"N 52°01'04"W	165	77	20	1.25	rock	< 2	1	0	sea stars flounder	Loran-C skipped, set repeated
26	159		593X 18741 793Z 43384	593X 18739 793Z 43391	170	63	22	1.50	rock	< 2	1	0	sand dollars basket stars queen crabs	occasional disarticulated scallop valves
27	150		593X 18725 793Z 43346	593X 18723 793Z 43348	175	61	15	1.00	rock	0	1	0	queen crabs flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
37	235		Red B 9.8 Grn I 44.5	Red B 9.8 Grn I 44.6	340	62	13	1.75	rock	0	1	0		
38	231		Red B 9.7 Grn I 44.9	Red B 10.0 Grn I 44.7	135	60	15	1.00		2	1	2		
39	19		Red B 11.4 Grn I 44.8	Red B 11.8 Grn I 44.6	60	51	15	1.00		3	1	3		
40	220		Red B 12.9 Grn I 41.0	Red B 13.2 Grn I 41.1	155	45	15	1.00		14	1	14		
41	22		Red B 14.6 Grn I 42.7	Red B 14.2 Grn I 42.4	315	43	17	1.25	rock	7	1	6		some disarticulated scallop valves
42	6		Red B 16.7 Grn I 37.5	Red B 16.7 Grn I 37.1	10	44	15	1.00	rock	41	1	41	sea stars flounder crabs	shell height-meat weight sample taken from this set
43	17		Red B 15.8 Grn I 38.0	Red B 16.0 Grn I 36.8	38	43	15	1.00	rock	<2	1	0		occasional disarticulated scallop valves
44	3		Red B 16.8 Grn I 33.0	Red B 16.9 Grn I 32.3	35	45	15	1.00	rock	2	1	2	sea stars queen crabs	
45	14		Red B 16.3 Grn I 34.3	Red B 16.0 Grn I 35.2	235	42	15	1.00	rock	0	1	0		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
55	263		Grn G 45.2 Pur A 68.1	Grn G 45.7 Pur A 68.5	305	61	16	1.00	rock	<2	2	0	basket stars flounder sand dollars	
56	266		Grn G 46.2 Pur A 68.5	Grn G 46.6 Pur A 68.6	180	70	15	1.00	rock	<2	2	0	sea stars sand dollars flounder	
57	32		Grn G 39.0 Pur A 71.5	Grn G 38.0 Pur A 71.9	10	47	17	1.25	rock	3	2	2	sea stars queen crab flounder	
58	272		Grn G 34.8 Pur A 74.8	Grn G 34.5 Pur A 75.2	75	64	15	1.00	rock	18	2	9	flounder queen crabs sea stars	some disarticulated scallop valves
59	33		Grn G 36.5 Pur A 74.4	Grn G 37.3 Pur A 73.8	210	43	15	1.00	rock	<2	2	0	sea stars queen crabs flounder	some disarticulated scallop valves
60	36		Grn G 42.6 Pur A 72.0	Grn G 42.4 Pur A 72.7	110	51	16	1.00	rock	15	2	8	sea stars flounder sand dollars	drag did not fill properly, set repeated
61	36		Grn G 42.4 Pur A 72.7	Grn G 42.6 Pur A 72.0	290	52	15	1.00	sand rocks	<2	2	0	sand dollars sea stars flounder	
62	48		Grn G 40.4 Pur A 75.0	Grn G 40.6 Pur A 74.1	160	42	16	1.00	sand	2	2	2	sand dollars flounder	
63		3	Grn G 40.8 Pur A 74.1	Grn G 41.5 Pur A 74.8	200	42	15	1.00	sand	<2	2	0	sand dollars flounder clams	occasional disarticulated scallop valves

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
73		9	Grn G 38.1 Pur A 76.5		150	40	17	1.25	sand	12	2	5	sand dollars flounder	
74		10	Grn G 39.9 Pur A 74.8		260	40	16	1.00		384	2	192		
75		11	Grn G 39.9 Pur A 74.8		158	40	17	1.25	rock	300	2	120	sea stars crabs	
76		12	Grn G 42.0 Pur A 74.2		90	40	20	1.25	rock	96	2	38	sea stars crabs	1 bushel = 500 scallops round wt. = 48 lbs. 500 meats = 4.5 lb.
77		13	Grn G 40.9 Pur A 75.0		0	39	16	1.00	rock	168	2	84	sea stars	occasional disarticulated scallop valves
78		14	Grn G 40.0 Pur A 74.0		200	40	20	1.25		408	2	163		
79		15	Grn G 42.9 Pur A 74.1		215	40	20	1.25	rock	24	2	10	sea stars	occasional disarticulated scallop valves
80		16	Grn G 44.5 Pur A 73.6		225	40	15	1.00	rock	126	2	63	sea stars	
81	72		Grn G 46.5 Pur A 72.9	Grn G 46.3 Pur A 72.7	250	39	15	1.00	rock	<2	2	0	flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
91	99		593X 14189 793Z 43946	593X 14016 793Z 43939	315	37	17	1.25	rock	175	2	70	sea stars	occasional disarticulated scallop valves
92		22	593X 14193 793Z 43956		100	37	18	1.25	rock	150	2	62	sea stars	occasional disarticulated scallop valves
93		23	593X 14194 793Z 43972		100	37	17	1.25	sand rock	<2	2	0	sand dollars flounder	
94	99		593X 14189 793Z 43947		315	37	17	1.25	sand rock	94	2	38	sand dollars flounder	
95	94		Grn H 31.9 Pur A 74.1	Grn H 30.5 Pur A 74.2	330	36	15	1.00	sand	14	2	7	sand dollars flounder	
96	88		Grn G 45.7 Pur A 75.3	Grn G 45.2 Pur A 75.3	300	37	15	1.00	sand rock	<2	2	0	sand dollars flounder	
97		24	Grn G 45.7 Pur A 75.6	Grn G 45.0 Pur A 75.3	200	38	15	1.00	rock	<2	2	0	flounder	
98	96		593X 14225 793Z 44080	Grn G 43.1 Pur A 76.0	300	37	15	1.00	rock	22	2	11	sea stars	
99	86		Grn G 44.4 Pur A 75.0		280	38	15	1.00	sand rock	4	2	2	sand dollars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
109	66		Grn F 37.1 Pur B 56.3	Grn F 38.2 Pur B 55.6	215	43	15	1.00	rock	0	2	0	sand dollars	
110	65		Grn F 37.3 Pur B 57.0	Grn F 36.3 Pur B 58.7	30	47	16	1.00	sand	<2	2	0	sand dollars urchins propellor clams	
111	69		Grn F 34.3 Pur B 58.7	Grn F 37.2 Pur B 60.4	55	45	16	1.00	rock	<2	2	0	sea stars	few disarticulated scallop valves
112	62		Grn F 47.2 Pur B 61.2	Grn F 46.6 Pur B 61.5	335	47	15	1.00	sandy rock	8	2	4	sand dollars flounder	
113	70		Grn E 45.5 Pur B 61.0	Grn E 44.5 Pur B 61.0	12	41	15	1.00	rock	0	2	0	flounder	
114	273		Grn E 33.0 Pur G 70.0	Grn E 32.7 Pur G 69.9	345	70	15	1.00	rock	5	2	3	sea stars flounder	
115	248		Grn E 31.2 Pur B 71.4	Grn E 30.8 Pur B 71.5	340	72	15	1.00	rock	0	2	0	sea stars	
116	250		Red B 5.4 Pur B 73.1	Red B 5.5 Pur B 73.1	300	78	15	1.00	rock	5	1	5	basket stars	not enough warp set repeated
117	250		Red B 6.6 Pur B 73.2	Red B 6.6 Pur B 73.7	300	72	15	1.00	rock	<2	1	0	basket stars flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
127		26	Red B 17.7 Pur B 56.5		90	46	15	1.00	rock	0	2	0	sea stars	
128		27	Red B 17.7 Pur B 56.9		170	46	15	1.00	rock	0	2	0	sea stars	
129		28	Red B 17.6 Pur B 56.2		70	45	15	1.00	rock	0	1	0	sea stars flounder	
130	252		Grn F 39.4 Pur B 53.9	Grn F 39.1 Pur B 52.1	300	55	15	1.00	rock	0	1	0	crabs flounder	
131	131		Grn F 41.1 Pur B 51.4	Grn F 41.3 Pur B 51.0	315	59	15	1.00	rock	0	1	0	flounder	
132	257		Grn F 44.1 Pur A 78.0	Grn F 44.3 Pur A 78.8	310	75	15	1.00	sand rock	0	1	0	brittle stars sand dollars queen crab	
133	246		Grn G 31.3 Pur A 75.2		220	64	16	1.00	rock	< 2	1	0	flounder	
134	270		Grn G 32.3 Pur A 75.8	Grn G 33.3 Pur A 74.3	230	55	15	1.00	rock	10	1	10	flounder	few disarticulated scallop valves
135	265		Grn G 36.9 Pur A 72.3		325	72	15	1.00	rock	< 2	1	0	queen crab flounder	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
145		36	Grn H 33.0 Pur A 65.7		230	39	15	1.00	rock	0	1	0	flounder	
146		37	Grn H 34.5 Pur A 64.0		275	40	15	1.00	rock	0	1	0	flounder	
147		38	Grn H 36.7 Pur A 63.7		270	45	15	1.00	rock	0	1	0	queen crab flounder	
148		39	Grn H 40.0 Pur A 61.5		230	46	20	1.25	rock	0	1	0	flounder	
149		40	Grn H 44.7 Pur A 60.2		210	53	15	1.00	rock	0	1	0		occasional disarticulated scallop valves
150		41	Grn H 43.9 Pur A 60.9		90	43	15	1.00	rock	0	1	0	flounder	
151		42	Grn H 42.4 Pur A 61.7		110	42	15	1.00	rock	0	2	0	flounder	
152		43	Grn H 38.8 Pur A 62.9		50	39	15	1.00	rock	0	1	0	flounder	
153		44	Grn H 35.8 Pur A 64.1	Grn H 35.3 Pur A 64.2	335	39	15	1.00	rock	0	1	0	sea stars	

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163		54	Grn H 35.2 Pur A 67.0		95	45	20	1.25	rock	<2	1	0	sea stars urchins sand dollars	
164		55	Grn H 34.1 Pur A 69.6		95	45	17	1.25	rock	4	1	3	flounder	
165		56	Grn H 33.1 Pur A 69.2		95	45	15	1.00	rock	10	1	10	flounder	
166		57	Grn H 32.1 Pur A 69.7		75	42	20	1.25	rock	0	1	0	sand dollars urchins	
167		58	Grn H 31.6 Pur A 70.5		75	41	15	1.00	rock	< 2	2	0	flounder	
168		59	Grn G 47.5 Pur A 71.2		110	40	15	1.00	sand rock	7	2	4	sand dollars	
169		60	Grn G 46.7 Pur A 71.6		60	40	15	1.00	rock	716	2	358	flounder	
170		61	Grn G 45.6 Pur A 72.4		140	39	15	1.00	rock	346	2	173	crabs sea stars urchins	
171		62	Grn G 45.2 Pur A 72.8		15	38	15	1.00	rock	598	2	299	flounder	

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181		72	Grn G 47.7 Pur A 72.6		234	39	15	1.00	rock	58	2	29	sea stars	
182		73	Grn H 31.3 Pur A 71.7		225	38	15	1.00	rock	198	2	99	sea stars crabs	
183		74	Grn H 32.8 Pur A 71.2		210	38	15	1.00	sand rock	299	2	150	sand dollars sea stars	
184		75	Grn H 34.5 Pur A 70.0		210	38	15	1.00	rock	196	2	98	sea stars	
185		76	Grn H 35.9 Pur A 70.6		210	38	20	1.25	rock	152	2	61	crabs	
186		77	Grn H 37.1 Pur A 69.3		210	38	20	1.25	rock	36	2	14	sea stars	
187		78	Grn H 38.2 Pur A 68.6		180	38	20	1.25	rock	94	2	38	sea stars sea cucumbers sand dollars	
188		79	Grn H 38.8 Pur A 68.4		180	38	20	1.25	sand rock	20	2	8	sand dollars	some disarticulated scallop valves
189		80	Grn H 39.5 Pur A 68.6		180	37	20	1.25	rock	198	2	79		some disarticulated scallop valves

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200		90	Grn H 41.8 Pur A 68.6		320	36	19	1.25	rock	110	2	44	sea stars	
201		91	Grn H 41.5 Pur A 68.4		320	36	15	1.00	rock	79	2	40	sea stars sea cucumbers clams	few disarticulated scallop valves
202		92	Grn H 41.7 Pur A 68.4		320	37	20	1.25	rock	141	2	56	sea stars sea cucumbers	few disarticulated scallop valves
203		93	Grn H 40.3 Pur A 69.0		320	37	20	1.25	rock	247	2	99	urchin, sand dollars, sea stars, sea cucumbers	some disarticulated scallop valves
204		94	Grn H 39.0 Pur A 68.5		15	37	20	1.25	clam shells rock	69	2	28	sea stars	
205		95	Grn H 39.8 Pur A 68.1		310	38	20	1.25	sand rock	3	2	2	sand dollars	
206		96	Grn H 41.1 Pur A 66.0		310	43	15	1.00	sand rock	<2	2	0	sand dollars	
207		97	Grn H 43.1 Pur A 64.4		315	45	15	1.00	rock	0	2	0	sand dollars flounder	
208		98	Grn H 45.2 Pur A 61.1		315	39	15	1.00	rock	0	2	0	flounder sea stars	

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			START	END										
218	237		Grn G 39.7 Pur A 68.4	Grn G 39.7 Pur A 62.6	0	84	18	1.25	rock	0	1	0	queen crab	
219	172		Grn G 37.4 Pur A 61.8	Grn G 36.8 Pur A 62.5	52	83	16	1.00	rock	0	1	0	queen crab	
220	166		Red B 16.6 Grn G 44.4		190	81	15	1.00	rock	0	1	0	sea stars flounder	
221	171		Red B 15.5 Grn G 31.2	Red B 14.5 Grn G 33.3	250	82	15	1.00	rock	0	1	0	sea stars flounder	
222	165		Red B 4.6 Grn I 31.4	Red B 5.0 Grn I 31.5	250	67	15	1.00	rock	<2	1	0	sea stars	
223	170		Red A 20.5 Grn I 43.0	Red A 21.5 Grn I 40.5	38	100	16	1.00	rock	0	1	0	basket stars	
224	169		Red H 48.8 Grn B 2.2	Red H 47.0 Grn B 2.4	200	80	13	0.75	rock	0	1	0	basket stars queen crab flounder	
225	162		Red B 9.3 Grn H 36.7	Red B 8.7 Grn A 36.3	315	76	19	1.25	rock	0	1	0	sea stars	
226	164		Red B 8.2 Grn H 36.6	Red B 8.5 Grn A 35.1	360	80	20	1.25	rock	0	1	0	sea stars	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
236	464		Red B 15.2 Grn I 47.3	Red B 15.4 Grn I 46.6	364	42	13	0.75	sand rock	7	1	9	sea stars sand dollars	
237	466		Red B 15.5 Grn I 45.0	Red B 15.5 Grn I 45.3	112	42	16	1.00	rock	6	1	6	sea stars flounder	
238	470		Red B 15.6 Grn I 44.8	Red B 16.0 Grn I 44.0	112	41	15	1,00	rock	2	1	2	sea stars	
239	469		Red B 16.8 Grn I 42.0	Red B 16.8 Grn I 42.3	162	43	15	1.00	rock	5	1	5	flounder	occasional disarticulated scallop valves
240	467		Red B 16.9 Grn I 43.2	Red B 16.2 Grn I 42.1	130	44	15	1.00	rock	3	1	3	clams sand dollars flounder	all flat fish guts examined and listed (no scallops found)
241	468		Red B 18.2 Grn I 40.2	Red B 18.2 Grn I 40.3	180	45	15	1.00	rock	<2	1	0	sea stars crabs	
242	426		Red B 19.6 Grn I 34.9	Red B 19.4 Grn I 35.4	270	46	16	1.00	sand rock	26	1	26	sand dollars	some disarticulated scallop valves all flat fish guts examined (no scallops)
243	427		Red B 18.9 Grn I 37.7	Red B 19.4 Grn I 36.6	105	45	15	1.00	sand rock	2	1	2	sea stars	
244	425		Red B 20.2 Grn I 37.7	Red B 19.8 Grn I 37.9	64	44	15	1.00	sand	4	1	4	sand dollars	

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			START	END										
254	402		Grn H 44.5 Pur A 66.9	Grn H 45.4 Pur A 66.3	240	36	15	1.00	sand	0	1	0	sand dollars	
255		103	Grn H 45.7 Pur A 66.2	Grn H 46.6 Pur A 66.2	212	36	16	1.00	sand	0	1	0	sand dollars	
256	404		Grn I 30.0 Pur A 65.3	Grn I 30.7 Pur A 64.9	255	35	12	0.75	sand	0	1	0	sand dollars	
257	408		Grn I 33.9 Pur A 63.8	Grn I 33.0 Pur A 64.9	315	37	15	1.00	rock	42	1	42	sea stars sea cucumbers	this is the barnacle -cucumber community which appears so productive for scallops
258		104	Grn I 36.4 Pur A 64.7	Grn I 37.9 Pur A 63.3	330	37	20	1.25	rock	7	2	3	sea stars flounder	
259	409		Grn I 36.9 Pur A 63.4		330	36	20	1.25	rock	15	1	12	sea stars	some disarticulated scallop valves, Decca navigation skipped
260	412		Grn I 37.7 Pur A 61.9	Grn I 38.0 Pur A 61.9	308	42	15	1.00	sand rock	32	1	32	sand dollars	
261	411		Grn I 42.0 Pur A 60.6	Grn I 43.9 Pur A 59.3	193	44	15	1.00	rock	<2	1	0	sea stars clams	
262		105	Grn I 42.9 Pur A 59.8	Grn I 43.5 Pur A 60.2	195	42	15	1.00	sand	121	2	61	sand dollars sea stars	few disarticulated scallop valves

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272		114	593X 14058 593Y 25105	593X 14055 593Y 25107	195	32	15	1.00	rock	< 2	2	0	sea cucumbers sea stars	some disarticulated scallop valves
273		115	593X 14055 593Y 25107	593X 14049 593Y 25112	195	33	20	1.25	sand rock	< 2	1	0	sand dollars sea cucumbers	guts of 4 plaice examined (>60 cm) contained capelin
274		116	593X 14040 593Y 25124	593X 14036 593Y 25129	225	32	19	1.25	sand rock	36	2	14	sand dollars sea cucumbers sea stars	
275		117	593X 14024 593Y 25138	593X 14031 593Y 25140	180	31	20	1.25	rock	28	2	11	sea cucumbers sea stars flat fish	some disarticulated scallop valves
276		118	593X 14031 593Y 25140	593X 14018 593Y 25142	180	30	15	1.00	rock	17	2	9	sea cucumbers sea stars	some disarticulated scallop valves
277		119	593X 14017 593Y 25142	593X 14015 593Y 25143	180	31	15	1.00	rock	12	2	6	sea cucumbers sea stars	few disarticulated scallop valves
278		120	593X 14010 593Y 25146	593X 14018 593Y 25148	180	30	20	1.25	rock	< 2	2	0	sea cucumbers sea stars	some large disarticulated scallop valves 1 giant scallop valve
279		121	593X 14012 593Y 25153	593X 14009 593Y 25156	193	30	15	1.00	rock	7	2	4	sea cucumbers sea stars	
280		122	593X 13996 593Y 25159	593X 13992 593Y 25162	185	30	15	1.00	sand rock	50	2	25	sand dollars sea stars	

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290		132	593X 13968 593Y 25184	593X 13959 593Y 25180	90	29	18	1.25	sand clam shells	<2	2	0	sand dollars	
291		133	593X 13969 593Y 25170	593X 13958 593Y 25179	130	29	22	1.50	clam shells	<2	2	0	clams crabs sea cucumbers	
292		134	593X 13968 593Y 25179	593X 14032 593Y 25168	135	30	18	1.25	clam shells	<2	2	0	clams Mesodesma sand dollars	
293		135	593X 14021 593Y 25140	593X 14015 593Y 25142	20	31	25	1.50	rock	26	2	9	crabs	
294		136	593X 14015 593Y 25147	593X 14008 593Y 25133	15	32	15	1.00	rock	5	2	3	sea stars crabs	
295		137	Red B 15.3 Grn J 42.2	Red B 16.7 Grn J 41.7	15	32	15	1.00	rock	7	2	4	sea cucumbers sea stars crabs	some disarticulated scallop valves
296		138	Red B 17.2 Grn J 39.6	Red B 16.5 Grn J 38.7	35	33	20	1.25	clam shells	<2	2	0	sea stars	
297		139	593X 14048 593Y 25097	593X 14051 593Y 25095	50	34			clam shells	6	2	3	sea cucumbers sea stars	
298		140	Red B 17.8 Grn J 33.4	Red B 17.7 Grn J 33.3	330	34	20	1.25	sand rock	<2	1	0	sand dollars sea stars sea cucumbers	

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			START	END										
308		148	Red B 16.5 Grn J 32.3	Red B 16.2 Grn J 33.8	315	38	25	1.75	rock	320	2	91	sea stars flounder	disarticulated scallop valves
309		149	Red B 16.1 Grn J 33.0	Red B 14.0 Grn J 32.3	310	38	17	1.25	rock	519	2	208	sea stars flounder	disarticulated scallop valves
310	432		Red B 15.9 Grn J 33.4	Red B 15.5 Grn J 34.3	295	38	32	2.50	rock	557	2	111		disarticulated scallop valves
311		150	Red B 15.4 Grn J 34.6	Red B 15.2 Grn J 35.0	300	39	25	1.75	rock	318	2	91	sea stars	many disarticulated scallop valves
312	435		Red B 15.5 Grn J 34.7	Red B 15.6 Grn J 35.7	140	40	25	1.75	rock	701	2	200	sea stars	disarticulated scallop valves
313		151	Red B 15.6 Grn J 35.7	Red B 15.3 Grn J 37.0	205	40	20	1.25	rock	226	2	90	sea stars	disarticulated scallop valves
314	436		Red B 15.3 Grn J 37.1	Red B 15.0 Grn J 37.8	270	40	20	1.25	rock	288	2	115	sea stars	disarticulated scallop valves
315		152	Red B 14.9 Grn J 38.2	Red B 14.6 Grn J 39.1	270	40	21	1.50	rock	104	2	35	sea stars	
316	437		Red B 13.8 Grn J 40.7	Red B 13.9 Grn J 40.9	180	39	15	1.00	rock	168	2	84		many disarticulated scallop valves

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			START	END										
326	488		Red B 9.5 Grn J 47.1	Red B 9.2 Grn J 47.3	320	42	15	1.00	sand rock	2	1	2	sand dollars	
327	484		Red B 9.1 Grn J 46.1	Red B 8.9 Grn J 46.6	315	42	15	1.00	rock	3	1	3	sea stars	
328	484		Red B 6.9 Grn J 31.8	Red B 6.4 Grn J 32.7	315	41	10	0.75	rock	<2	1	0		too rocky for a longer tow
329	487		Red B 5.2 Grn A 55.1	Red B 5.8 Grn A 34.0	75	41	15	1.00	rock	<2	1	0	sea stars	
330	486		Red B 6.5 Grn A 33.2	Red B 6.7 Grn A 33.0	150	41	16	1.00	rock	130	1	130	sea stars	some disarticulated scallop valves
331	489		Red B 7.3 Grn A 33.3	Red B 7.3 Grn A 33.4	180	40	15	1.00	rock	6	1	6		few disarticulated scallop valves
332		157	Red B 7.4 Grn A 33.5	Red B 7.3 Grn A 33.2	335	38	14	1.00	sand	3	1	3	sand dollars	
333	491		Red B 7.3 Grn A 33.4	Red B 7.7 Grn A 33.5	90	39	16	1.00	sand	<2	1	0	sand dollars sea stars	
334		158	Red B 9.0 Grn A 31.5	Red B 9.2 Grn A 31.2	140	41	15	1.00	sand	6	1	6	sand dollars sea stars	some disarticulated scallop valves

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW		DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
			START	END										
344	556		Red A 16.1 Grn B 47.1	Red A 15.8 Grn B 47.4	335	39	15	1.00	sand	0	1	0	sand dollars	
345	555		Red A 14.1 Grn C 30.5	Red A 14.0 Grn C 30.4	0	39	15	1.00	sand rock	<2	1	0	sea stars sand dollars	
346		160	Red A 14.5 Grn B 47.2	Red A 14.5 Grn B 46.6	34	39	15	1.00	rock	95	1	95	sea stars	few disarticulated scallop valves
347		161	Red A 14.5 Grn B 46.7		0	38	15	1.00	rock	49	2	25	sea stars	many disarticulated scallop valves
348	547		Red A 14.1 Grn B 45.5	Red A 15.3 Grn B 44.3	75	38	15	1.00	rock	11	1	11	sea stars	
349	501		Red A 17.0 Grn B 41.6	Red A 17.6 Grn B 40.5	140	38	15	1.00	rock	<2	1	0	sea stars flat fish	
350	546		Red A 14.7 Grn B 43.2		95	37	15	1.00	rock	5	1	5	sea stars	bearings unreliable
351		162	Red A 16.8 Grn B 40.3	Red A 15.1 Grn B 42.5	275	37	15	1.00	rock	23	2	12	sea stars	
352	545		Red A 11.0 Grn B 46.3	Red A 11.7 Grn B 46.7	340	38	15	1.00	rock	48	2	24	sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW		DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
			START	END										
362	534		Red A 14.5 Grn B 34.8	Red A 13.5 Grn B 35.2	260	47	15	1.00	rock	<2	2	0	sea stars	plaice gut examined (62 cm) contained propellor clams, urchins & sea cucumbers
363	531		Red A 11.8 Grn B 36.8	Red A 10.8 Grn B 35.5	350	51	15	1.00	rock	0	1	0	sea stars	few disarticulated scallop valves
364	532		Red A 15.8 Grn B 30.2	Red A 15.0 Grn B 31.2	290	44	15	1.00	rock	<2	1	0	sea stars	few disarticulated scallop valves
365	530		Red A 12.5 Grn B 33.2	Red A 11.6 Grn B 34.2	315	46	15	1.00	rock	<2	1	0	crabs	
366	584		Red A 8.2 Grn B 38.5	Red A 8.2 Grn B 39.0	230	55	15	1.00	rock	0	1	0	sea stars	
367	578		Red A 8.4 Grn B 42.0	Red A 7.7 Grn B 42.9	295	59	15	1.00	sand rock	0	1	0	sand dollars sea stars	
368	579		Red A 5.0 Grn B 45.9	Red A 5.0 Grn B 44.6	190	48	15	1.00	rock	0	1	0	sea stars	
369	577		Red A 4.8 Grn C 31.1	Red A 4.7 Grn C 31.5	210	44	15	1.00	rock	0	1	0	sea stars	
370	165		Red A 7.1 Grn B 47.4	Red A 8.1 Grn B 46.7	142	43	15	1.00	sand	0	1	0	sand dollars sea stars flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
380	550		Red A 4.6 Grn C 37.9	Red A 5.3 Grn C 36.9	50	50	15	1.00	rock	0	1	0		
381	543		Red A 6.8 Grn C 34.2		300	58	15	1.00	rock	0	1	0	basket stars	
382		166	Red A 1.6 Grn C 39.6	Red A 1.2 Grn C 39.7	350	47	15	1.00	rock	0	1	0		
383	573		Red A 1.3 Grn C 39.3	Red A 1.3 Grn C 39.7	210	45	15	1.00	rock	0	1	0	sea stars	
384	573		Red J 22.5 Grn C 44.7	Red J 22.3 Grn C 45.3	210	50	15	1.00	rock	0	1	0	sea stars	
385	569		Red J 21.8 Grn C 46.6	Red J 22.3 Grn C 46.2	175	44	15	1.00	rock	<2	1	0		
386	566		Red A 0.7 Grn C 45.4	Red A 13.0 Grn C 44.9	150	55	15	1.00	rock	0	1	0	flat fish	
387	561		Red A 2.6 Grn C 44.5	Red A 2.4 Grn C 72.3	245	44	15	1.00	rock	<2	1	0	sea stars	
388	562		Red A 0.0 Grn C 31.0	Red A 23.6 Grn C 31.2	340	41	15	1.00	rock	<2	1	0	sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
398	635		Red J 2.0 Grn E 32.0	Red J 1.1 Grn E 32.8	255	43	15	1.00	rock	11	1	11	sea stars	disarticulated scallop valves
399	624		Red I 21.4 Grn E 36.0	Red I 21.7 Grn E 36.0	190	44	15	1.00	rock	46	1	46	crabs sea stars urchins	
400		167	Red I 21.7 Grn E 36.0	Red I 22.4 Grn E 35.7	190	45	15	1.00	rock	2	2	1	sea stars crabs	
401	632		Red I 23.3 Grn E 36.0	Red I 22.8 Grn E 35.6	165	48	15	1.00	sand rock	<2	1	0	sand dollars	
402	642		Red J 4.1 Grn E 32.3	Red J 3.6 Grn E 33.0	160	48	15	1.00	rock	2	1	2		
403	648		Red J 3.0 Grn E 34.8		205	51	15	1.00	rock	0	1	0	sea stars	few disarticulated scallop valves
404		168	Red I 1.7 Grn E 36.6	Red I 1.9 Grn E 36.7	210	49	15	1.00	rock	0	1	0	basket stars	
405	649		Red J 2.4 Grn E 37.0	Red J 1.5 Grn E 37.7	310	54	15	1.00	rock	<2	1	0	basket stars	few disarticulated scallop valves
406	633		Red I 21.3 Grn E 40.9	Red E 22.1 Grn E 39.9	65	52	15	1.00	rock	0	1	0	sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
416	699		593X 14043 593Y 25728	593X 14046 593Y 25733	325	44	15	1.00	rock	14	1	14	urchins	few disarticulated scallop valves
417	626		593X 14030 593Y 25737	593X 14026 593Y 25737	190	47	15	1.00	rock	<2	1	0	sea stars	few disarticulated scallop valves
418	627		593X 14010 593Y 25802	593X 14014 593Y 25794	20	50	15	1.00	sand	0	1	0	brittle stars flounder	
419		127	593X 14031 593Y 25766	593X 14034 593Y 25758	10	47	15	1.00	rock	80	1	80	sea stars sand dollars	some disarticulated scallop valves
420		173	593X 14036 593Y 25756	593X 14040 593Y 25752	10	45	15	1.00	rock	55	1	55	sea stars urchins	some disarticulated scallop valves, hole in bottom of rake
421	651		593X 14042 593Y 25749	593X 14042 593Y 25759	285	46	15	1.00	rock	0	1	0	sea stars	
422	616		593X 14042 593Y 25776	593X 14043 593Y 25765	90	48	15	1.00	rock	25	1	25	sea stars	many disarticulated scallop valves, shell height - meat wt sample taken from this set
423		174	593X 14032 593Y 25774	593X 14033 593Y 25761	90	47	18	1.25	rock	88	1	70	sea stars	numerous disarticulated scallop valves and cluckers
424		175	593X 14033 593Y 25759	593X 14035 593Y 25737	85	46	15	1.00	rock	35	1	35	urchins sea stars	many disarticulated scallop valves

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
434		184	593X 14074 593Y 25538	593X 14075 593Y 25546	315	37	15	1.00	rock	7	1	7	sea stars	few disarticulated scallop valves
435		185	593X 14075 593Y 25548	593X 14077 593Y 25552	330	40	15	1.00	rock	6	1	6	sea stars	
436		186	593X 14078 593Y 25553	593X 14081 593Y 25557	350	40	18	1.25	rock	2	1	2	sea stars	
437		187	593X 14082 593Y 25556	593X 14084 593Y 25554	0	41	15	1.00	rock	2	1	2	sea stars	few disarticulated scallop valves
438		188	593X 14086 593Y 25553		0	48	15	1.00	rock	0	1	0	sea stars	
439		189	593X 14090 593Y 25554		0	46	15	1.00	rock	<2	1	0	sea stars flounder	
440		190	593X 14094 593Y 25547	593X 14098 593Y 25544	0	47	15	1.00	sand rock	0	1	0	sand dollars	
441		191	593X 14099 593Y 25543	593X 14102 593Y 25537	0	47	15	1.00	rock	0	1	0	sea stars	
442		192	593X 13919 593Y 25303		160	35	22	1.00	rock	0	2	0	sea stars	loran bearings show unreliable, however readings believed to be in general area

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
452		202	593X 13822 593Y 25339	593X 13820 593Y 25340	165	35	15	1.00	clam shells	0	2	0	sea cucumbers sand dollars	
453		203	593X 13818 593Y 25341	hold to 45 fathom edge 593Y 25346	180	43	15	1.00	clam shells	2	2	1		
454		204	593X 13814 hold to 48 fathom contour	593X 13814	180	49	15	1.00	clam shells	0	2	0	brittle stars sea cucumbers	
455		205	hold to 45 fathom contour 593Y 25369	593Y 25374	180	45	15	1.00	clam shells	0	2	0	brittle stars sea cucumbers sea stars	
456		206	hold to 40 fathom contour 593Y 25389	593Y 25393	135	41	15	1.00	clam shells	0	2	0	mussels sea cucumbers	
457		207	593X 13777 593Y 25408	593X 13774 593Y 25413	290	36	15	1.00	clam shells	0	2	0	sea cucumbers flounder brittle stars	
458		208	593X 13766 593Y 25429	593X 13763 593Y 25434	260	35	15	1.00	clam shells	0	2	0	brittle stars	
459		209	593X 13756 593Y 25448	593X 13753 593Y 25453	260	42	15	1.00	clam shells	<2	2	0	brittle stars sea stars	
460		210	593X 13742 593Y 25468	593X 13730 593Y 25471	290	51	15	1.00	clam shells	0	2	0	sea stars sand dollars	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
470		220	593X 13789 593Y 25543		305	45	15	1.00		0	1	0	brittle stars sea stars	
471		221	593X 13806 593Y 25558	593X 13798 593Y 25560	320	46	15	1.00		0	2	0	brittle stars urchins sea cucumbers	
472		222	593X 13805 593Y 25566	593X 13808 593Y 25567	320	48	15	1.00		0	2	0	brittle stars sea cucumbers	
473		223	593X 13834 593Y 25527	593X 13838 593Y 25522	15	46	15	1.00		0	1	0	brittle stars sea cucumbers flounder	
474		224	593X 13863 593Y 25480	593X 13867 593Y 25474	15	40	15	1.00		0	1	0	brittle stars sea cucumbers flounder	
475		225	593X 13904 593Y 25413	593X 13908 593Y 25406	15	47	15	1.00	sand	0	1	0	brittle stars sand dollars flounder	
476		226	593X 13919 593Y 25387	593X 13922 593Y 25381	15	42	15	1.00	sand	0	1	0	sand dollars flounder	
477		227	593X 13937 593Y 25356	593X 13941 593Y 25351	0	41	20	1.25	rock	0	1	0	sand dollars	
478		228	593X 13966 593Y 25327	593X 13969 593Y 25319	20	40	15	1.00	sand	0	1	0	sand dollars brittle stars flat fish	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW		DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
			START	END										
488		238	593X 14064 593Y 25248	593X 14066 593Y 25248	330	34	15	1.00	rock	0	2	0	sea stars flat fish	
489		239	593X 14072 593Y 25249	593X 14074 593Y 25248	330	45	15	1.00	rock	0	2	0		
490		240	593X 14078 593Y 25252	593X 14079 593Y 25254	320	42	15	1.00	sand	0	2	0	sand dollars	
491		241	593X 14084 593Y 25259	593X 14085 593Y 25260	320	47	15	1.00	rock	0	2	0	sea stars	
492		242	593X 14089 593Y 25266	593X 14091 593Y 25268	320	41	15	1.00	rock	0	2	0	sea stars	
493		243	593X 14096 593Y 25275		320	45	15	1.00	rock	0	2	0	sea stars	
494		244	593X 14107 593Y 25285	593X 14102 593Y 25288	320	54	15	1.00	rock	0	1	0	sea stars	
495		245	593X 14119 593Y 25296	593X 14120 593Y 25297	320	52	15	1.00	rock	0	2	0	sea stars	
496		246	593X 14120 593Y 25310	593X 14122 593Y 25397	320	45	15	1.00	rock	0	2	0	sea stars	

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
506		256	593X 14242 593Y 25340	593X 14244 593Y 25342	350	69	15	1.00	rock	0	1	0	basket stars sea stars crabs	
507		257	593X 14252 593Y 25348	593X 14255 593Y 25350	340	53	15	1.00	sand rock	0	2	0	sand dollars sea stars flounder	
508		258	593X 14261 593Y 25357	593X 14264 593Y 25360	350	44	15	1.00	rock	0	2	0	sea stars crabs	rake saturated
509		259	593X 14274 593Y 25362	593X 14266 593Y 25371	330	38	15	1.00	rock	0	2	0	sea stars	rake saturated
510		260	593X 14266 593Y 25375	593X 14270 593Y 25383	340	39	15	1.00	rock	0	2	0	sea stars	rake saturated
511		261	593X 14271 593Y 25390	593X 14272 593Y 25406	320	38	25	1.75	rock	0	2	0	sea stars flounder	rake saturated
512		262	593X 14237 593Y 25409	593X 14275 593Y 25418	320	35	15	1.00	rock	0	1	0	sea stars	
513		263	593X 14275 593Y 25421	593X 14273 593Y 25436	280	36	18	1.25	rock	0	1	0	sea stars sea cucumbers	rake saturated
514		264	593X 14273 593Y 25439	593X 14283 593Y 25453	280	32	15	1.00	rock	<2	1	0	sea stars	rake saturated

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
524		274	593X 14281 593Y 25593	593X 14280 593Y 25606	275	45	15	1.00	rock	0	2	0	sea stars	
527		275	593X 14280 593Y 25630	593X 14280 593Y 25659	290	45	15	1.00	rock	0	2	0	sea stars crabs	
526		276	593X 14280 593Y 25659	593X 14281 593Y 25663	305	41	15	1.00	rock	0	2	0	sea stars	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
10	133		593X 14252 593Y 25339	593X 14255 593Y 25328	40	51	18	1.50	rock	2	1	2	green crabs	
11		1	593X 14249 593Y 25218	593X 14249 593Y 25208	118	46	13	1.00	rock	5	2	3	flounder, sea cucumbers	occasional disarticulated scallop valves
12	126		593X 14243 593Y 25190	593X 14241 593Y 25184	160	53	17	1.25	rock	< 2	1	0		occasional disarticulated scallop valves
13	137		593X 14245 593Y 25249	593X 14253 593Y 25111	35	51	19	1.75	sand	0	1	0	sand dollars flounder	
14	138		593X 14237 593Y 25204	593X 14237 593Y 25217	290	66	20	1.25	rock	< 2	1	0		
15	135		593X 14230 593Y 25234	593X 14230 593Y 25219	128	75	20	1.25	rock	0	1	0	crabs sea stars	
16	141		593X 14224 593Y 25238	593X 14220 593Y 25248	230	80	20	1.25	rock	2	1	2		
17	131		593X 14216 593Y 25215	593X 14216 593Y 25225	310	85	20	1.25	rock	<2	1	0		
18	157		593X 14227 593Y 25135	593X 14227 593Y 25145	300	86	19	1.00	rock	2	1	2		some disarticulated scallop valves

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
28	161		593X 18731 793Z 43303	593X 18721 793Z 43285	257	45	15	1.00	rock	0	1	0	basket stars flounder	
29	163		593X 18726 793Z 43286	593X 18726 793Z 43280	235	57	15	1.00	rock	10	1	10	sea stars flounder queen crabs	unreliable navigation readings
30		2	593X 18734 793Z 43233	593X 18732 793Z 43238	180	55	19	1.25		45	1	36	sea cucumbers flounder queen crabs	
31	4		593X 18728 793Z 43218	593X 18726 793Z 43221	165	45	23	1.50		80	1	53		
32	2		Red B 2.1 Grn J 38.0	Red B 2.9 Grn J 37.1	360	41	15	1.00	rock	5	2	3	sea stars flounder	
33	10		Red B 0.5 Grn J 41.0	Red B 0.4 Grn J 41.6	195	44	15	1.00	rock	<2	2	0	sea stars flounder crabs	occasional disarticulated scallop valves
34	5		Red B 5.1 Grn J 36.2	Red B 5.0 Grn J 36.0	330	40	15	1.00	rock	2	1	2	flounder	
35	210		Red B 8.3 Grn I 45.1	Red B 9.0 Grn I 44.2	130	59	15	1.00	rock	0	1	0		
36	235		Red B 9.8 Grn I 44.1	Red B 9.8 Grn I 44.5	175	60	15	1.00						dredge inverted set repeated

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
46	24		Red B 15.7 Grn I 33.7	Red B 16.3 Grn I 31.0	55		15	1.00		2	1	2		
47	7		Red B 18.3 Grn H 43.1	Red B 18.5 Grn H 42.1	360	51	16	1.00	rock	10	1	10	flounder crabs sea stars	
48	1		Red B 19.2 Grn H 35.3	Red B 19.4 Grn H 35.1	144	50	16	1.00	rock	0	1	0	sea stars urchins flounder	occasional disarticulated scallop valves
49	26		Grn H 35.7 Pur A 62.6	Grn H 35.7 Pur A 63.0	65	59	15	1.00	rock	5	1	5	sea stars flounder sea cucumbers	
50	21		Grn H 32.3 Pur A 64.0	Grn H 32.5 Pur A 64.5	110	51	15	1.00	rock	6	1	6	sea stars crabs urchins	
51	26		Grn H 35.7 Pur A 65.6	Grn B 21.6 Pur A 62.6	15	49	15	1.00	rock	21	1	21	crabs urchins	occasional disarticulated scallop valves
52	29		Grn G 41.7 Pur A 67.5	Grn G 42.3 Pur A 67.2	290	52	16	1.00	rock	16	1	16	urchins flounder	few disarticulated scallop valves
53	261		Grn G 42.8 Pur A 68.8	Grn G 41.6 Pur A 68.0	317	53	15	1.00	rock	15	2	8	urchins flounder	few disarticulated scallop valves. Not enough warp for rake to fish properly
54	251		Grn G 46.5 Pur A 67.2	Grn G 46.3 Pur A 67.4	126	53	15	1.00	rock	<2	2	0	basket stars flounder	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
64		4	Grn G 42.0 Pur A 74.6	Grn G 42.4 Pur A 74.4	190	40	15	1.00		0	2	0		
65		5	Grn G 42.3 Pur A 74.5	Grn G 42.8 Pur A 75.9	120	39	19	1.25		146	2	58		
66		6	Grn G 41.7 Pur A 74.2		120	40	20	1.25		375	2	150		
67		7	Grn G 41.0 Pur A 74.6		120	40	24	1.50		118	2	39		
68	43		Grn G 35.1 Pur A 76.2	Grn G 34.7 Pur A 76.3	350	44	15	1.00	rock	<2	2	0	sea stars queen crab urchins	few disarticulated scallop valves
69	38		Grn G 30.1 Pur A 79.0	Grn G 30.6 Pur A 78.8	200	44	15	1.00	rock	<2	2	0	flounder	few disarticulated scallop valves
70	74		Grn F 46.6 Pur B 50.8	Grn F 46.7 Pur B 50.5	305	45	15	1.00	sand rock	< 2	2	0	sand dollars flounder	
71	79		Grn G 36.1 Pur A 77.6	Grn G 36.7 Pur A 77.3	235	39	14	1.00	rock	14	2	7	sea stars	few disarticulated scallop valves
72		8	Grn G 37.2 Pur A 77.0		235	40	15	1.00	rock	18	2	9		

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82	98		Grn G 46.7 Pur A 72.0	Grn G 47.5 Pur A 71.4	240	39	15	1.00	rock	385	2	193	crabs flounder	numerous disarticulated scallop valves
83		17	Grn G 47.8 Pur A 71.3	Grn H 30.1 Pur A 71.3	60	39	15	1.00	sand	96	2	48	sand dollars	
84	85		Grn H 33.0 Pur A 70.6	Grn H 33.8 Pur A 69.9	140	39	15	1.00	sand stones	13	2	7	sand dollars	
85	75		Grn H 34.8 Pur A 70.3	Grn H 35.5 Pur A 69.7	245	38	15	1.00	rock	137	2	69	flounder	
86	90		Grn H 37.0 Pur A 69.1	Grn H 37.8 Pur A 68.6	240	37	15	1.00	rock	29	2	15	sand dollars	
87		18	Grn H 36.5 Pur A 69.5		140	38	15	1.00	sand rock	33	2	17	sand dollars sea stars	
88		19	Grn H 36.9 Pur A 70.0		140	38	15	1.00	sand	< 2	2	0	sand dollars	
89		20	Grn H 36.8 Pur A 70.7		180	38	15	1.00	rock	87	2	44	sea cucumbers sea stars	many broken barnacle shells so trash appears white, scallops heavily encrusted with barnacles
90		21	Grn H 36.3 Pur A 69.9		180	37	20	1.25	rock	17	2	9	sea stars	

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100	78		593X 14236 793Z 44119	593X 14237 793Z 44121	330	39	15	1.00	rock	78	2	39	sea stars	
101	93		593X 14245 793Z 44153	593X 14248 793Z 44153	315	40	16	1.00	rock	3	2	2.	sea stars	
102	104		593X 14252 793Z 44125	593X 14255 793Z 44130	355	40	15	1.00	rock	30	2	15	sea stars	
103	76		593X 14264 793Z 44132		335	40	15	1.00	rock	20	2	10	sea stars	
104	92		593X 14269 793Z 44140	593X 14271 793Z 44140	340	40	15	1.00	rock	<2	2	0	flounder	
105	81		593X 14281 793Z 44135	593X 14283 793Z 44135	345	40	15	1.00	rock	<2	2	0	queen crabs sea stars urchins	
106	80		593X 14296 793Z 44200	593X 14298 793Z 44196	315	42	18	1.25	rock	6	2	2	flounder	
107	58		593X 14310 793Z 44100	593X 14312 793Z 44109	330	46	15	1.00	rock sand	<2	2	0	sand dollars propellar clams	
108	57		Grn F 38.7 Pur B 55.9		215	43	15	1.00	sand rock	<2	2	0	sand dollars	occasional disarticulated scallop valves

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118	277		Red B 8.4 Pur B 69.0	Red B 8.1 Pur B 69.4	350	70	20	1.25	rock	2	1	2	basket stars flounder	
119	267		Grn E 41.9 Pur B 59.8	Grn E 42.9 Pur B 61.4	210	72	15	1.00	rock	0	1	0	sea stars flounder	
120	260		Grn E 44.8 Pur B 58.4	Grn E 45.9 Pur B 58.6	205		15	1.00			1			rake inverted set repeated
121	260		Grn E 45.6 Pur B 59.0	Grn E 44.5 Pur B 38.8	130	60	15	1.00	rock	102	1	102		some disarticulated scallop valves
122		25	Grn E 45.8 Pur B 58.2	Grn E 46.6 Pur B 58.2	245	60	15	1.00	rock	156	1	156	queen crabs flounder	some disarticulated scallop valves
123	256		Grn E 44.1 Pur B 60.3	Grn E 43.6 Pur B 60.6	130	60	15	1.00	rock	32	1	32	flounder	
124	269		Grn E 46.1 Pur B 58.8	Grn E 47.1 Pur B 58.2	180	60	15	1.00	rock	9	1	9	queen crabs basket stars	some disarticulated scallop valves
125	243		Red B 18.3 Pur B 53.2	Red B 19.0 Pur B 4.0	117	61	15	1.00	rock	0	1	0	queen crabs basket stars	
126	247		Red B 18.8 Pur B 56.2	Red B 19.9 Pur B 56.2	145	48	16	1.00	rock	<2	1	0	sea stars	some disarticulated scallop valves

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136	240		Grn G 35.7 Pur A 71.3	Grn G 36.2 Pur A 71.0	280	68	15	1.00	rocks	<2	1	0	queen crab flounder	
137		29	Grn G 36.4 Pur A 70.5	Grn G 37.8 Pur A 70.1	300	60	14	1.00	rocks	0	1	0	sea stars	
138		30	Grn G 39.8 Pur A 67.5		300	52	18	1.25	rocks	5	1	4	sea stars	
139	236		Grn G 36.9 Pur A 68.8	Grn G 36.7 Pur A 70.9	320	57	16	1.00	rocks	0	1	0	sea stars	occasional disarticulated scallop valves
140		31	Grn G 38.7 Pur A 68.2		178	62	17	1.25	rocks	0	2	0	sea stars queen crabs	
141		32	Grn G 43.5 Pur A 67.9		230	53	17	1.25	rocks	60	2	24	sea stars urchins	
142		33	Grn G 41.4 Pur A 68.8	Grn G 41.8 Pur A 68.8	170	56	16	1.00	rocks	17	2	9	sea stars	
143		34	Grn G 46.9 Pur A 66.3	Grn G 47.9 Pur A 65.7	220	50	15	1.00		0	2	0		
144		35	Grn H 32.3 Pur A 65.0		225	40	15	1.00	rocks	0	1	0	sea stars	

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154		45	Grn H 33.4 Pur A 65.8	Grn H 33.7 Pur A 65.1	90	37	15	1.00	rock	0	1	0	sea stars	
155		46	Grn H 33.9 Pur A 65.3	Grn H 33.9 Pur A 64.4	170	39	12	0.75	rock	0	1	0		
156		47	Grn H 33.1 Pur A 65.3	Grn H 33.8 Pur A 66.6	140	50	18	1.25	rock	41	1	33	sea stars	
157		48	Grn H 33.0 Pur A 65.3		165	47	15	1.00	rock	48	1	48	sea stars	occasional disarticulated scallop valves
158		49	Grn H 33.1 Pur A 67.3		170	44	20	1.25	rock	102	1	82	sea stars	occasional disarticulated scallop valves
159		50	Grn H 33.1 Pur A 67.2		140	47	25	1.75	rock	119	1	68	sea stars	occasional disarticulated scallop valves
160		51	Grn H 32.5 Pur A 67.6		130	49	25	1.75	rock	37	1	21	sea stars urchins	
161		52	Grn H 34.9 Pur A 67.6		150	45	15	1.00	rock	141	1	141		
162		53	Grn H 35.3 Pur A 67.7		160	45	15	1.00	rock	51	1	51	flounder	some disarticulated scallop valves

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172		63	Grn G 43.8 Pur A 73.6		135	38	15	1.00	rock	181	2	91		an anchor came up in one rake decreasing its efficiency
173		64	Grn G 43.6 Pur A 74.9		100	38	15	1.00	sand	14	2	7	sand dollars propellor clams	some disarticulated scallop valves
174		65	Grn G 42.5 Pur A 74.3		325	39	15	1.00	rock	146	2	73	sea stars	some disarticulated scallop valves
175		66	Grn G 42.0 Pur A 74.5		20	38	15	1.00	sand	22	2	11	sand dollars	
176		67	Grn G 40.8 Pur A 75.1		180	38	15	1.00	sand rock	52	2	26	sand dollars	
177		68	Grn G 42.5 Pur A 74.5		200	39	15	1.00	sand rock	14	2	7	sand dollars flounder	
178		69	Grn G 43.6 Pur A 73.9		180	39	15	1.00	rocks	29	2	15	sea stars flounder urchins	
179		70	Grn G 45.8 Pur A 75.0		230	39	15	1.00	rock	66	2	33	sea stars	
180		71	Grn G 46.0 Pur A 74.2		235	39	15	1.00	rock	3	2	2	sea stars	

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190		81	Grn H-39.7 Pur A 68.1		120	37	20	1.25	sand rock	51	2	20	sand dollars	
191		82	Grn H 39.4 Pur A 68.3		210	37	20	1.25	sand rock	92	2	37	sand dollars sea stars crabs	
192		83	Grn H 40.7 Pur A 68.3		160	37	20	1.25	rock	53	2	21		
193		84	Grn H 40.1 Pur A 68.3		150	36	20	1.25	rock	19	2	8	sea stars	occasional disarticulated scallop valves
194		85	Grn H 40.2 Pur A 69.2		180	35	20	1.25	rock	10	2	4	sea stars	
195		86	Grn H 40.8 Pur A 69.3		220	35	20	1.25	rock	22	2	9	sea stars	occasional disarticulated scallop valves
196		87	Grn H 41.5 Pur A 69.4		110	35	23	1.50	sand rock	18	2	6	sea stars sand dollars	set 196, 197 same set, occurred as overlap between shifts
198		88	Grn H 41.0 Pur A 69.6		320	35	15	1.00	sand rock	<2	2	0	sand dollars flounder	occasional disarticulated scallop valves
199		89	Grn H 41.7 Pur A 68.7		320	36	15	1.00	sand rock	137	2	69	sea stars barnacles	occasional disarticulated scallop valves

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209	214		Red B 14.4 Grn I 32.9	Red B 14.1 Grn I 32.9	320	61	15	1.00	rock	0	1	0	queen crabs basket stars	
210	230		Red I 33.0 Grn B 13.5	Red I 31.7 Grn B 14.0	48	64	15	1.00	rock	0	1	0	basket stars queen crab	
211	226		Red B 16.1 Grn H 42.9	Red B 16.6 Grn H 43.7	295	62	15	1.00	sand gravel	9	1	5	queen crab flounder	
212	219		Red B 13.1 Grn H 47.2	Red B 13.8 Grn H 46.8	70	64	15	1.00	rock	0	1	0	flounder	
213	238		Red B 15.5 Grn H 42.1	Red B 15.1 Grn H 42.5	320	67	15	1.00	rock	< 2	1	0	sea stars queen crab flounder	
214	221		Red B 14.0 Grn H 41.9		115	71	15	1.00	rock	< 2	1	0	sea stars	
215	213		Red B 17.0 Grn H 37.8		226	73	15	1.00	rock	0	1	0	sea stars queen crab flounder	
216	224		Red B 18.3 Grn H 36.0	Red B 19.7 Grn H 35.4	56	56	15	1.00	rock	< 2	1	0	queen crab	
217	212		Grn H 44.4 Pur A 63.6	Grn H 44.6 Pur A 43.4	310	51	19	1.25	rock	4	1	3	sea stars crabs	

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227	168		Red B 13.9 Grn G 41.6	Red B 13.1 Grn G 41.9	290	93	15	1.00	rock	0	1	0	sea stars	
228	524		Red B 3.3 Grn J 46.8	Red B 3.3 Grn J 47.0	180	53	16	1.00	rock	<2	1	0	sea stars flounder	4 - 5 plaice all with sand dollars in gut
229	522		Red B 7.5 Grn J 40.3	Red B 7.9 Grn J 40.8	120	45	15	1.00	rock	8	1	8	sea stars flounder	occasional disarticulated scallop valves
230	523		Red B 8.8 Grn J 38.0	Red B 9.2 Grn J 37.8	148	47	16	1.00	rock	12	1	12	sea stars	
231	474		Red B 10.8 Grn J 37.2	Red B 11.3 Grn J 36.1	74	41	14	1.00	rock	58	1	58		
232	471		Red B 12.7 Grn J 32.9	Red B 13.0 Grn J 32.6	150	46	18	1.25	rock	76	1	61	sea stars	
233	472		Red B 13.3 Grn J 32.7	Red B 13.4 Grn J 32.8	160	43	15	1.00	rock	34	1	34	sea stars flounder	
234	473		Red B 13.5 Grn J 33.0	Red B 14.9 Grn J 32.2	98	42	14	1.00		46	1	46		
235	465		Red B 14.5 Grn J 30.8	Red B 14.7 Grn J 30.0	9	42	14	1.00	rock	<2	1	0	sea stars	

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245	415		Grn I 30.7 Pur A 63.9	Grn I 30.1 Pur A 64.7	98	44	15	1.00	rock	41	1	41	sea cucumbers	
246	414		Grn I 30.8 Pur A 63.9	Grn I 30.7 Pur A 63.6	172	43	17	1.25	sand rock	65	1	52	sand dollars	few disarticulated scallop valves
247		99	Grn I 30.4 Pur A 63.9	Grn I 30.0 Pur A 64.0	116	44	15	1.00	sand rock	285	2	143	sand dollars flounder	
248		100	Grn H 47.8 Pur A 63.1	Grn H 47.3 Pur A 64.2	116	41	15	1.00	sand rock	0	2	0	sand dollars	
249		101	Grn H 47.8 Pur A 64.0	Grn I 30.6 Pur A 63.6	270	41	18	1.25	sand	0	2	0	sand dollars flounder	few disarticulated scallop valves
250		102	Grn H 46.5 Pur A 65.0	Grn H 46.1 Pur A 65.8	120	38	14	1.00	clam shells	0	1	0		
251	403		Grn H 44.3 Pur A 66.5	Grn H 44.8 Pur A 67.4	120	39	14	1.00	clam shells	0	1	0	sand dollars	
252	401		Grn H 40.8 Pur A 66.0		248	38	15	1.00	rock	<2	1	0	sea stars	
253	400		Grn H 40.9 Pur A 68.9	Grn H 41.3 Pur A 68.5	248	38	15	1.00	rock	51	1	51	sea stars	few disarticulated scallop valves

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263	410		Grn I 44.2 Pur A 60.0	Grn I 44.8 Pur A 59.8	230	41	20	1.25	rock	423	2	169	sea stars	few disarticulated scallop valves
264		106	Grn I 46.2 Pur A 59.8	Grn I 47.3 Pur A 59.5	230	41	20	1.25	sand	256	2	102	sand dollars sea stars	few disarticulated scallop valves
265		107	Grn I 47.4 Pur A 59.3	Grn J 30.7 Pur A 60.3	180	40	22	1.50	sand rock	604	2	201	sand dollars sea stars	many disarticulated scallop valves
266		108	Grn J 31.7 Pur A 61.0	Grn J 32.6 Pur A 61.8	230	40	18	1.25	sand rock	327	2	131	sand dollars sea stars flounder	many disarticulated scallop valves
267		109	593X 14106 593Y 25067	593X 14103 593Y 25071	190	39	20	1.25	rock	22	1	18	sea stars clam shells	some disarticulated scallop valves
268		110	593X 14096 593Y 25075	593X 14093 593Y 25077	190	38	20	1.25	rock	<2	1	0	sea stars crabs	some disarticulated scallop valves
269		111	593X 14087 593Y 25082	593X 14083 593Y 25085	200	37	20	1.25	rock	10	1	8	sea stars	some disarticulated scallop valves
270		112	593X 14077 593Y 25090	593X 14074 593Y 25092	190	34	20	1.25	shell	0	1	0	sea cucumbers clams Mesodesma sand dollars	
271		113	593X 14067 593Y 25098	593X 14064 593Y 25100	200	34	19	1.25	rock	10	1	8	sea stars sea cucumbers	some disarticulated scallop valves ground up barnacle shells

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
281		123	593X 13489 593Y 25164	593X 13987 593Y 25166	185	29	20	1.25	sand rock	74	2	30	sand dollars sea stars	
282		124	593X 13984 593Y 25169	593X 13981 593Y 25172	190	29	17	1.25	sand rock	3	2	2	sand dollars sea cucumbers sea stars	
283		125	593X 13980 593Y 25173	593X 13977 593Y 25175	190	29	18	1.25	sand	0	2	0	sand dollars sea stars	
284		126	593X 13973 593Y 25179	593X 13970 593Y 25182	205	28	18	1.25	sand rock	0	2	0	sand dollars crabs sea cucumbers	
285		127	593X 13964 593Y 25176	593X 13962 593Y 25189	240	29	18	1.25	rock	0	2	0	sea cucumbers sea stars sand dollars	
286		128	593X 13970 593Y 25195	593X 13946 593Y 25198	240	27	16	1.00	rock	<2	2	0	sea stars sand dollars sea cucumbers	few disarticulated scallop valves
287		129	593X 13965 593Y 25192		330	28	19	1.25	rock	0	2	0	sand dollars sea stars	
288		130	593X 13983 793Z 43574	593X 13995 593Y 25180	100	28	20	1.25	sand rock clam shells	0	1	0	sand dollars sea stars	few disarticulated scallop valves
289		131	593X 14019 593Y 25178	593X 13968 593Y 25184	90	38	19	1.25	sand	3	2	2	sand dollars sea stars sea cucumbers	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
299		141	Red B 17.7 Grn J 32.7	Red B 17.8 Grn J 32.3	330	34	20	1.25	rock	9	1	7	sea stars	
300		142	Red B 17.8 Grn J 31.6	Red B 17.7 Grn J 31.6	330	37	20	1.25	rock	13	1	10	sea stars sea cucumbers	
301		143	Red B 17.6 Grn J 31.4	Red B 17.5 Grn J 31.4	330	36	20	1.25	clam shells	<2	1	0		few disarticulated scallop valves
302		144	Red B 17.4 Grn J 31.4	Red B 17.4 Grn J 31.3	330	36	15	1.00	rock	17	1	17	sea stars	few disarticulated scallop valves
303	434		Red B 17.2 Grn J 31.3	Red B 17.2 Grn J 31.4	320	38	15	1.00	rock	58	1	58	sea stars	some disarticulated scallop valves
304		145	Red B 17.2 Grn J 31.4	Red B 17.1 Grn J 31.4	305	39	23	1.50	rock	55	2	18	sea stars urchins sea cucumbers	many disarticulated scallop valves
305		146	Red B 17.0 Grn J 31.4	Red B 16.9 Grn J 31.3	330	38	20	1.25	clam & scallop shells	50	2	20	crabs sea stars urchins	many disarticulated scallop valves
306	433		Red B 17.0 Grn J 31.4	Red B 16.9 Grn J 31.1	305	38	20	1.25	rock	123	2	49	sea stars crabs	shell height - meat weight sample taken from this set
307		147	Red B 16.6 Grn J 31.8	Red B 16.5 Grn J 32.2	310	38	15	1.00	rock	530	2	265	sea stars	disarticulated scallop valves

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
317	438		Red B 13.6 Grn J 41.3	Red B 13.4 Grn J 41.5	320	40	15	1.00	rock	10	2	5	sea stars sea cucumbers	
318		153	Red B 13.0 Grn J 43.0	Red B 12.9 Grn J 43.6	220	38	15	1.00	rock	6	2	3	sea stars	
319	445		Red B 11.8 Grn J 46.5	Red B 12.0 Grn J 46.8	180	37	15	1.00	rock	8	2	4	sea stars flounder	
320		154	Red B 11.8 Grn J 46.0	Red B 11.7 Grn J 46.7	340	37	15	1.00	sand rock	25	2	13	sea stars sand dollars	
321		155	Red B 11.7 Grn J 46.1	Red B 11.8 Grn J 45.7	0	39	15	1.00	rock	128	2	64	sea stars	many disarticulated scallop valves
322	444		Red B 11.6 Grn J 45.4	Red B 11.3 Grn J 44.8	10	40	15	1.00	rock	58	2	29		
323		156	Red B 11.4 Grn J 44.6	Red B 11.5 Grn J 44.1	0	40	15	1.00	rock	46	2	23		
324	441		Red B 11.7 Grn J 44.3	Red B 12.0 Grn J 44.3	330	40	15	1.00	rock	34	2	17	sea stars	
325	449		Red B 10.7 Grn J 44.2	Red B 10.0 Grn J 44.9	300	41	15	1.00	rock	< 2	1	0	sea stars	few disarticulated scallop valves

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
335	442		Red B 9.7 Grn A 30.6	Red B 9.8 Grn A 30.5	170	40	15	1.00	sand	22	1	22	sand dollars flat fish	few disarticulated scallop valves
336	443		Red B 9.9 Grn A 31.2	Red B 9.7 Grn A 31.5	200	38	15	1.00	rock	<2	1	0	sea stars	few disarticulated scallop valves
337	446		Red B 9.4 Grn A 33.6	Red B 9.2 Grn A 34.3	220	38	15	1.00	sand rock	17	1	17	sand dollars	numerous disarticulated scallop valves
338	448		Red B 8.3 Grn A 37.0	Red B 8.2 Grn A 37.6	215	37	15	1.00	rock	8	1	8		disarticulated scallop valves
339	497		Red B 5.0 Grn A 43.3	Red B 4.7 Grn A 43.9	280	39	15	1.00	sand rock	3	1	3	sea stars sand dollars	numerous disarticulated scallop valves
340	498		Red B 2.2 Grn A 47.8	Red B 1.8 Grn B 30.4	350	39	15	1.00	sand rock	<2	1	0	sand dollars flounder	
341	499		Red B 0.3 Grn B 32.9	Red B 0.0 Grn B 33.2	345	38	15	1.00	sand rock	<2	1	0	sand dollars	
342	560		Red A 22.0 Grn B 38.2	Red A 21.2 Grn B 39.4	250	38	15	1.00	rock	<2	1	0	sea stars	few disarticulated scallop valves
343		159	Red A 17.7 Grn B 44.9	Red A 17.2 Grn B 45.6	290	39	15	1.00	rock	41	1	41	sea stars	few disarticulated scallop valves

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
353	541		Red A 12.8 Grn B 43.2	Red A 13.2 Grn B 42.4	20	42	15	1.00	sand	<2	2	0	sand dollars flat fish	Decca may have skipped a lane
354	538		Red A 13.2 Grn B 30.8	Red A 13.6 Grn B 39.0	50	46	15	1.00	rock	<2	2	0	sea stars	
355	539		Red A 15.7 Grn B 37.7	Red A 16.8 Grn B 36.2	140	47	15	1.00	rock	0	1	0	sea stars flounder	
356	513		Red A 19.9 Grn B 30.3	Red A 19.5 Grn B 30.6	320	44	15	1.00	rock	0	1	0	sea stars	
357		163	Red A 17.2 Grn B 31.3	Red A 16.6 Grn B 30.7	330	45	15	1.00	rock	0	1	0	sea stars	
358		164	Red A 16.9 Grn B 32.2		195	47	15	1.00	rock	0	1	0	sea stars flounder	
359	536		Red A 17.0 Grn B 33.3	Red A 17.1 Grn B 33.5	190	43	15	1.00	rock	<2	1	0	sea stars	few disarticulated scallop valves
360	537		Red A 14.3 Grn B 38.0	Red A 13.5 Grn B 38.7	310	47	15	1.00	rock	<2	1	0	sea stars	
361	535		Red A 10.9 Grn B 41.3	Red A 10.5 Grn B 41.5	345	45	15	1.00	rock	<2	1	0	flat fish	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
371	540		Red A 9.4 Grn B 45.6	Red A 9.5 Grn B 45.7	175	45	15	1.00	rock	0	1	0		
372	542		Red A 10.1 Grn B 46.5	Red A 10.3 Grn B 46.8	180	39	15	1.00	rock	4	1	4	sea stars	few disarticulated scallop valves
373	544		Red A 10.3 Grn C 30.5	Red A 10.7 Grn C 30.3	180	39	15	1.00	rock	<2	1	0	sea stars	
374	548		Red A 11.2 Grn C 31.5	Red A 9.6 Grn C 32.3	315	39	15	1.00	rock	4	1	4		
375	554		Red A 10.3 Grn C 35.7	Red A 10.0 Grn C 36.8	270	39	15	1.00	rock	0	1	0		
376	553		Red A 6.5 Grn C 42.2	Red A 6.8 Grn C 38.8	90	58	15	1.00	rock	0	1	0	sea stars	
377	552		Red A 7.3 Grn C 38.8		0	48	15	1.00	rock	0	1	0	sea stars flounder	Decca unreliable
378	551		44°57'19" 52°24'03"		20	51	15	1.00	rock	0	1	0	sea stars flounder	navigation unreliable
379	549		Red A 6.8 Grn C 36.2	Red A 6.2 Grn C 36.9	310	42	15	1.00	rock	0	1	0	sea stars	

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			START	END										
389	563		Red J 23.0 Grn D 30.4	Red J 22.5 Grn D 31.1	295	46	15	1.00	rock	0	1	0		
390	564		Red J 20.9 Grn D 32.9	Red J 20.7 Grn D 33.3	210	45	15	1.00	rock	0	1	0	sea stars	
391	646		Red J 12.2 Grn D 45.7	Red J 11.8 Grn D 46.5	235	49	15	1.00	rock	0	1	0		
392	645		Red J 10.9 Grn D 45.7	Red J 9.8 Grn D 46.4	310	48	15	1.00	sand rock	0	1	0	basket stars sand dollars	
393	647		Red J 7.4 Grn E 31.1	Red J 7.6 Grn E 30.0	52	47	15	1.00	rock	0	1	0	basket stars	
394	643		Red J 9.3 Grn D 45.5	Red J 8.7 Grn D 45.8	345	46	15	1.00	rock	0	1	0	sea stars	
395	641		Red J 7.0 Grn D 46.8	Red J 7.1 Grn D 46.3	40	45	15	1.00	rock	5	1	5		
396	650		Red J 8.0 Grn D 44.7	Red J 8.0 Grn D 44.4	10	42	15	1.00	rock	8	1	8	sea stars flat fish	
397	636		Red J 5.4 Grn E 46.0	Red J 5.0 Grn E 46.1	345	43	15	1.00	rock	<2	1	0	flat fish	

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407	634		Red I 23.8 Grn E 37.8	Red I 30.5 Grn E 36.9	65	48	15	1.00	sand rock	0	1	0	sea stars sand dollar	
408		169	Red I 21.6 Grn E 30.5	Red I 20.9 Grn E 39.7	315	47	15	1.00	sand rock	0	1	0	sea stars sand dollars	few disarticulated scallop valves
409		170	Red I 19.8 Grn E 39.3	Red I 20.8 Grn E 38.9	20	48	15	1.00	sand rock	3	1	3	sand dollars sea stars	few disarticulated scallop valves
410	630		Red I 19.5 Grn E 40.6	Red I 18.8 Grn E 41.4	260	50	15	1.00	sand rock	<2	1	0	brittle stars sand dollars urchins	
411	631		Red I 19.0 Grn E 42.4	Red I 18.0 Grn E 43.4	240	53	15	1.00	sand	0	1	0	brittle stars sand dollars sea cucumbers sea stars	
412	629		Red I 46.6 Grn E 13.6	Red I 44.3 Grn E 16.2	85	54	20	1.25	sand	0	1	0	brittle stars sand dollars	
413	628		593X 14023 593Y 25767	593X 14026 593Y 25763	330	50	15	1.00	rock	27	1	27	sea stars	numerous disarticulated scallop valves
414		171	593X 14826 593Y 25763	593X 14027 593Y 25748	120	50	15	1.00	rock	10	2	5	sea stars	many disarticulated scallop valves
415	625		593X 14035 593Y 25699	593X 14034 593Y 25706	220	45	15	1.00	gravel	40	1	40	sea stars urchins crabs	

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425		176	593X 14035 593Y 25737	593X 14036 593Y 25726	80	45	15	1.00	rock	44	2	22	sea stars urchins	
426		177	593X 14036 593Y 25726	593X 14040 593Y 25694	90	36	15	1.00	rock	9	2	5	sea stars	
427		178	593X 14044 593Y 25658	593X 14044 593Y 25650	90	41	15	1.00	rock	3	2	2	crabs sea stars	
428		179	593X 14045 593Y 25626	593X 14047 593Y 25618	75	40	15	1.00	rock	93	2	47	sea stars crabs	few disarticulated scallop valves
429		180	593X 14047 593Y 25616	593Y 14048 593Y 25603	80	38	15	1.00	rock	120	2	60	sea stars crabs	few disarticulated scallop valves
430		181	593X 14049 593Y 25602	593X 14051 593Y 25587	65	38	20	1.25	rock	66	2	26	crabs sea stars urchins	
431		182	593X 14052 593Y 25585	593X 14055 593Y 25569	70	38	30	2.00	rock	24	2	12	sea stars	
432	622		593X 14055 593Y 25568	593X 14061 593Y 25555	20	38	15	1.00	rock	15	2	8	sea stars	occasional disarticulated scallop valves
433		183	593X 14061 593Y 25555	593X 14066 593Y 25553	340	37	15	1.00	rock	6	2	3	sea stars	

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443		193	593X 13929 593Y 25304	593X 13929 593Y 25305	160	34	15	1.00	rock	0	2	0	sea stars	bearings showing unreliable
444		194	593X 13907 593Y 25306	593X 13905 593Y 25304	160	33	15	1.00	rock clam shells	0	2	0	sea stars	
445		195	593X 13896 593Y 25425	593X 13894 593Y 25476	160	29	15	1.00	clam shells sand	0	2	0	sand dollars	
446		196	593X 13887 593Y 25448	593X 13885 593Y 25309	160	30	15	1.00	clam shells rocks	0	2	0	sea stars	
447		197	593X 13875 593Y 25313	593X 13875 593Y 25313	160	31	15	1.00	clam shells	0	2	0	sea stars sea cucumbers	
448		198	593X 13863 593Y 25320	593X 13861 593Y 25324	180	28	15	1.00	clam shells	0	2	0	Arctica Spisula sand dollars	
449		199	593X 13859 593Y 25328	593X 13847 593Y 25330	170	35	15	1.00	clam shells	0	2	0	sand dollars sea cucumbers	
450		200	593X 13840 593Y 25333	593X 13849 593Y 25332	160	31	18	1.25	clam shells	0	2	0	sand dollars sea cucumbers mussels	
451		201	593X 13832 593Y 25332	593X 13830 593Y 25335	160	32	16	1.00	clam shells	0	2	0	crabs sea cucumbers	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
461		211	593X 13748 593Y 25498	593X 13758 593Y 25500	300	44	15	1.00	clam shells	<2	2	0	basket stars brittle stars	few disarticulated scallop valves
462		212	593X 13746 593Y 25514	593X 13748 593Y 25515	327	47	15	1.00	rock	<2	2	0	basket stars sea stars	few disarticulated scallop valves
463		213	593X 13745 593Y 25519	593X 13746 593Y 25519	327	46	15	1.00	rock	0	2	0	brittle stars sea cucumbers	
464		214	593X 13756 593Y 25521	follow 50 fa. contour 593Y 25520	follow 50fa contour	50	15	1.00	rock	0	1	0	brittle stars sea cucumbers	
465		215	follow 48 fathom contour 593Y 25515	593Y 25513	320	48	15	1.00		0	1	0	brittle stars sea cucumbers sea stars	
466		216	follow 48 fathom contour 593Y 22518	593Y 22521	320	48	15	1.00		0	1	0	brittle stars	
467		217	follow 45 fathom contour 593Y 25529	593Y 25530	320	45	15	1.00		0	1	0	brittle stars sea stars	
468		218	follow 48 fathom contour 593Y 25538	593Y 25540	320	47	15	1.00		0	1	0	brittle stars flat fish	
469		219	593X 13787 593Y 25538	593X 13790 593Y 25536	330	44	15	1.00		0	1	0	brittle stars	

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479		229	593X 13984 593Y 25296	593X 13988 593Y 25291	20	39	15	1.00	sand	0	2	0	sand dollars flat fish sea stars	
480		230	593X 14000 593Y 25274	593X 13993 593Y 25269	10	38	25	1.75	rock	9	2	5	sea stars	
481		231	593X 13996 593Y 25265		10	37	15	1.00	rock	0	2	0	sea stars	
482		232	593X 14010 593Y 25246	593X 14011 593Y 25243	15	35	15	1.00	rock	3	2	2	sea stars	
483		233	593X 14022 593Y 25233	593X 14025 593Y 25230	335	35	15	1.00	rock	11	2	5	sea stars	
484		234	593X 14036 593Y 25223	593X 14038 593Y 25222	335	38	15	1.00	rock	4	2	2	sea stars	
485		235	593X 14041 593Y 25202	593X 14054 593Y 25211	330	40	15	1.00	rock	<2	2	0	sea stars	loran indicated bearings unreliable
486		236	593X 14067 593Y 25223	593X 14067 593Y 25225	300	38	15	1.00	rock	0	2	0	sea stars	
487		237	593X 14059 593Y 25232	593X 14060 593Y 25235	310	37	15	1.00	rock	0	2	0	sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
497		247	593X 14130 593Y 25335	593X 14141 593Y 25337	320	44	15	1.00	rock	0	2	0	sea stars flounder	
498		248	593X 14140 593Y 25344	593X 14144 593Y 25343	320	45	15	1.00	rock	0	2	0	sea stars	
499		249	593X 14149 593Y 25339	593X 14152 593Y 25336	340	40	15	1.00	rock	0	2	0	sea stars	
500		250	593X 14159 593Y 25334	593X 14162 593Y 25334	340	52	15	1.00	rock	<2	2	0	sea stars	
501		251	593X 14177 593Y 25334	593X 14179 593Y 25333	350	54	15	1.00	rock	15	2	8	sea stars urchins	few disarticulated scallop valves shell height - meat wt sample taken at this set
502		252	593X 14189 593Y 25331	593X 14192 593Y 25332	320	80	15	1.00	rock	0	1	0	basket stars crabs	
503		253	593X 14205 593Y 25329	593X 14208 593Y 25330	0	85	15	1.00	rock	0	1	0	basket stars crabs	
504		254	593X 14218 593Y 25328	593X 14221 593Y 25332	345	82	15	1.00	rock	<2	1	0	basket stars crabs	
505		255	593X 14231 593Y 25330	593X 14233 593Y 25334	345	70	15	1.00	rock	0	1	0	brittle stars sea stars crabs	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE LOUISE"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
515		265	593X 14283 593Y 25455	593X 14271 593Y 25474	280	33	20	1.25	rock	0	1	0	sea stars	rake saturated
516		266	593X 14271 593Y 25478		320	33	21	1.50	rock	0	1	0	sea stars	rake saturated
517		267	593X 14274 593Y 25495	593X 14275 593Y 25575	320	34	20	1.25	rock	0	2	0	sea stars flounder	rake saturated
518		268	593X 14275 593Y 25519	593X 14278 593Y 25539	320	35	22	1.50	rock	0	1	0	sea stars	rake saturated
519		269	593X 14278 593Y 25541	593X 14274 593Y 25556	250	41	22	1.50	rock	0	1	0	sea stars	
520		270	593X 14274 593Y 25558	593X 14271 593Y 25571	250	45	18	1.25	rock	6	2	3	sea stars crabs	
521		271	593X 14270 593Y 25575	593X 14272 593Y 25585	250	48	15	1.00	rock	0	2	0	sea stars urchins	
522		272	593X 14272 593Y 25587	593X 14276 593Y 25588	0	50	16	1.00	rock	0	2	0	basket stars sea stars	
523		273	593X 14278 593Y 25589	593X 14281 593Y 25590	0	47	15	1.00	rock	0	2	0	basket stars sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
1	130		Red I 17.0 Grn D 32.0	Red I 16.8 Grn D 31.3	20	81	18	0.75	rock	0	1	0	basket stars	
2	136		593X 14210 593Y 25355	593X 14214 593Y 25345	53	81	19	0.75	rock	<2	1	0	crabs sea stars basket stars urchins	
3	132		593X 14217 593Y 25336	593X 14220 593Y 25327	53	80	19	0.75	rock	0	1	0	sea stars basket stars	
4	122		593X 14223 593Y 25315	593X 14220 593Y 25312	176	79	18	0.75	rock	<2	1	0	crabs basket stars sea stars	
5	125		593X 14201 593Y 25317	593X 14214 593Y 25306	71	81	15	0.75	rock	0	1	0	sea stars crabs	
6	139		46°08.9'N 53°25.9'W	46°05.3'N 53°32.1'W	171	82	18	1.00	rock	0	1	0	sea stars crabs	
7	148		593X 14193 593Y 25261	593X 14191 593Y 25256	145	71	23	1.25	rock	3	1	2	basket stars crabs sea stars	
8	147		593X 14188 593Y 25253	593X 14188 593Y 25243	106	65	20	1.50	rock	<2	1	0	basket stars crabs flounder	
9	158		593X 14188 593Y 25233	593X 14186 593Y 25242	250	64	18	1.25	rock	<2	1	0	crabs sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
19	145		593X 14192 593Y 25217	593X 14195 593Y 25121	75	67	15	1.00	rock	0	1	0	sea stars	
20	160		593X 14206 593Y 25088	593X 14208 593Y 25082	76	61	19	1.25	rock	<2	1	0	crabs basket stars	
21	9		Red A 14.8 Grn A 36.0	Red A 16.2 Grn A 35.0	125	48	20	1.25	rock	15	1	12	sea stars crabs	
22	16		Red A 19.9 Grn A 31.2	Red A 19.9 Grn A 31.7	190	39	16	1.00	rock	<2	1	0	sea stars flounder crabs	
23	20		Red A 20.1 Grn A 36.4	Red A 20.9 Grn A 35.1	65	39	15	1.00	rock	<2	1	0	sea stars urchins crabs	
24	8		Red A 23.5 Grn A 0.00	Red B 0.3 Grn J 47.3	131	43	18	1.00	rock	5	1	5	sea stars crabs urchins	
25		3	Red B 1.4 Grn J 46.3		130	43	15	1.00	rock	0	1	0		
26	23		Red B 5.1 Grn J 42.3	Red B 6.9 Grn J 41.3	114	47	18	1.00	rock	0	1	0	sea stars basket stars sand dollars	
27	13		Red B 11.7 Grn J 31.8	Red B 12.2 Grn J 30.6	25	48	18	1.00	rock	4	1	4		

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW		DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
			START	END										
37	45		Grn H 41.0 Pur A 63.7	Grn H 41.6 Pur A 63.3	275	36	17	1.00	rock	2	1	2	crabs sea stars	
38	49		Grn H 44.4 Pur A 61.9	Grn H 45.5 Pur A 61.5	221	43	17	1.00	rock	3	1	3	sea cucumbers crabs sea stars	
39		4	Grn I 31.2 Pur A 60.5		221	45	11	1.00	rock	2	1	0		
40		5	Grn I 33.2 Pur A 59.9		211	46	13	1.00	rock	115	1	115		
41		6	Grn I 34.5 Pur A 59.7		173	44	12	1.00	rock	73	1	73		
42	46		Red B 17.4 Grn I 13.4	Red B 17.5 Grn I 37.6	160	43	16	1.00	rock	2	1	2	sea stars crabs flounder	
43	51		Grn I 39.1 Pur A 59.2	Grn I 38.0 Pur A 59.7	90	45	19	1.25	rock	4	1	3		
44	50		Grn I 34.7 Pur A 60.3	Grn I 33.8 Pur A 60.2	45	45	16	1.00	rock	2	1	0		
45	31		Grn I 32.1 Pur A 61.4	Grn I 31.8 Pur A 61.1	358	45	15	1.00	rock	2	1	2	sea stars flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW		DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
			START	END										
55	52		Grn H 37.9 Pur A 56.8	Grn H 36.8 Pur A 67.3	70	45	18	1.25	rock	30	1	24	sea stars	many disarticulated scallop valves
56	35		Grn H 33.9 Pur A 67.9	Grn H 34.7 Pur A 67.6	200	47	18	1.25	rock	2	1	0		
57	39		Grn H 40.1 Pur A 66.4	Grn H 39.4 Pur A 66.8	115	45	19	1.25	sand	7	1	6	sand dollars	
58	82		Grn H 38.3 Pur A 67.7	Grn H 37.7 Pur A 68.0	115	41	18	1.25	sand	<2	1	0	sand dollars	
59		8	Grn H 36.4 Pur A 68.7		225	38	25	1.50		0	1	0		
60		9	593X 14199 793Z 43869		335	38	15	1.00	sand rock	85	1	85	sand dollars sea stars clams	
61		10	593X 14204 793Z 43872		160	38	18	1.25	rock	85	1	68	sea stars urchins flounder	
62	102		593X 14204 793Z 43871	593X 14202 793Z 43871	173	38	14	1.00	sand gravel	59	1	59	sand dollars flounder crabs	gonad samples takenfor later determination of maturity stages
63	103		593X 14193 793Z 43858	593X 14191 793Z 43850	282	38	16	1.00	sand	60	1	60	sea stars sand dollars	sounding record ruined, 38 fathom featureless bottom

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
73	77		593X 14197 793Z 44092	593X 14199 793Z 44100	95	36	10	1.00	rock	<2	1	0	sea stars crabs flounder	strong tide and current
74	83		593X 14199 793Z 44102	593X 14200 793Z 44103	353	37	12	1.00	rock	0	1	0	sea stars	
75		16	593X 14233 793Z 44150		5	40	15	1.00	sand	0	1	0	sand dollars	
76	89		593X 14248 793Z 44179	593X 14250 793Z 44184	6	40	11	0.75	sand	<2	1	0	sand dollars urchins flounder	
77	101		593X 14252 793Z 44184	593X 14254 793Z 44183	358	40	11	0.75	sand	0	1	0	sand dollars sea stars crabs	
78		17	593X 14261 793Z 44195		358	41	17	1.25	sand	0	1	0	sand dollars	
79		18	593X 14271 793Z 44210		30	38	26	1.75	rock	0	1	0		
80	73		593X 14273 793Z 44205	593X 14285 793Z 44213	40	40		1.00	sand rock	<2	1	0	sand dollars sea stars flounder	
81		19	593X 14271 793Z 44226		105	42	20	1.25	rock	0	1	0	sea stars	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
91	59		Grn F 31.9 Pur B 63.4	Grn F 32.5 Pur B 62.9	225	48	17	1.25	rock	<2	1	0	basket stars urchins sea stars	
92	62		Grn F 33.4 Pur B 62.1	Grn F 33.2 Pur B 61.8	305	47	17	1.25	sand rock	<2	1	0	sand dollars sea stars	
93	68		Grn F 33.6 Pur B 62.4		320	47	18	1.25	rock	105	1	84	basket stars	
94		24	Grn F 32.8 Pur B 62.9	Grn F 32.5 Pur B 62.8	320	46	20	1.25	rock	0	1	0	sea stars	
95	56		Grn F 30.5 Pur B 21.7	Grn F 47.5 Pur B 62.1	320	47	17	1.25	sand rock	<2	1	0	sand dollars sea stars	
96	60		Grn E 42.4 Pur B 66.8	Grn E 42.3 Pur B 66.4	265	48	16	1.00	sand gravel	11	1	11	sea stars basket stars sand dollars	
97	67		Grn E 44.7 Pur B 63.2	Grn E 44.0 Pur B 63.8	350	49	13	1.00	sand	0	1	0	sand dollars basket stars	
98		25	Grn E 42.9 Pur B 64.7	Grn E 42.2 Pur B 65.0	350		15	1.00	sand rock	0	1	0	sand dollars sea stars crabs	
99	61		Red B 12.2 Grn E 39.5	Red B 11.8 Grn E 38.7	23	46	17	1.00	sand gravel	<2	1	0	sea stars urchins sand dollars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
109	274		Red B 10.5 Pur B 64.2	Red B 10.9 Pur B 63.7	182	63	15	1.00	rock	141	1	141	crabs basket stars flounder	many scallops were crushed
110	245		Red B 15.5 Pur B 58.6	Red B 15.7 Pur B 58.2	270	64	17	1.25	sand rock	34	1	27	basket stars sand dollars	
111		26	593X 14404 793Z 44120	593X 14419 793Z 44115	220	120	13	0.75		0	1	0		deep hole rake empty
112	264		Grn F 30.3 Pur B 53.4	Grn F 31.4 Pur B 52.5	230	62	17	1.25	rock	6	1	5	basket stars brittle stars urchins	
113	253		Red B 20.7 Grn F 39.4	Red B 20.6 Grn F 39.1	112	74	17	1.00	sand	0	1	0	brittle stars sand dollars queen crabs	
114	262		Red B 19.8 Grn F 37.1	Red B 19.8 Grn F 37.5	140	60	17	1.00	rock sand	< 2	1	0	basket stars sea stars sand dollars	
115	244		Red B 20.3 Grn F 39.3	Red B 20.5 Grn F 39.9	242		17	1.00	rock	3	1	3	brittle stars basket stars sand dollars	
116	268		Grn F 47.0 Pur A 74.1	Grn G 0.0 Pur A 73.6	232	90	17	1.00	rock gravel	0	1	0	brittle stars basket stars queen crabs	
117	275		Grn G 31.6 Pur A 72.7	Grn G 32.2 Pur A 72.2	296	75	23	1.50	sand gravel	<2	1	0	sand dollars basket stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
127	234		Grn G 39.4 Pur A 63.0	Grn G 37.9 Pur A 63.5			17	1.00	rock	0	1	0	basket stars urchins	station moved 1.25 mile N by 0.75 mile E to avoid cable
128	209		Grn G 31.9 Pur A 66.4	Grn G 30.9 Pur A 67.1	85	82	17	1.00	rock	0	1	0	basket stars	station moved to 2.0 mile NNE to avoid cable
129	216		Grn F 39.5 Pur A 74.2	Grn F 39.1 Pur A 74.6	115	74	17	1.25	rock	0	1	0	basket stars	
130	228		Grn F 38.0 Pur A 77.0	Grn F 36.8 Pur A 77.9	40	74	19	1.25	sand rock	<2	1	0	basket stars urchins sand dollars	
131		27	Grn F 36.1 Pur A 78.0	Grn F 35.0 Pur A 79.0	45	71	20	1.25	rock	0	1	0	sea stars	
132	218		Grn F 33.4 Pur A 79.7	Grn F 32.7 Pur A 79.5	320	77	19	1.25	rock	0	1	0		
133	227		Grn F 31.0 Pur A 78.0	Grn F 30.7 Pur A 77.7	295	70	17	1.25	rock	0	1	0	basket stars	
134	190		Grn E 42.0 Pur B 50.3	Grn E 40.7 Pur B 0.9	5	75	18	1.00	rock	0	1	0	basket stars	
135	183		Grn E 34.8 Pur B 54.1	Grn E 35.6 Pur B 54.7	11	73	17	1.00	rock	0	1	0	queen crabs crabs basket stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
145	177		Grn F 30.8 Pur A 69.9	Grn F 30.0 Pur A 70.1	10	97		1.00	rock	0	1	0		
146	176		Grn E 37.9 Pur A 75.0	Grn E 36.8 Pur A 74.3	20	100	20	1.00	rock	0	1	0		
147	175		Grn E 44.0 Pur A 68.7	Grn E 43.5 Pur A 68.6	315	95	18	1.00	rock	0	1	0		adjusted station 1.5 mile NNW to avoid cable
148	521		Red B 0.7 Grn A 35.0	Red B 1.7 Grn A 34.5	105	48	16	1.00	rock	<2	1	0	sea stars flounder crabs	
149	520		Red B 5.5 Grn J 45.2	Red B 6.0 Grn J 45.0	145	40	18	1.25	rock	52	1	42	sea stars crabs	
150	519		Red B 6.8 Grn J 44.4	Red B 7.4 Grn J 43.6	120	44	18	1.25	rock	<2	1	0	sea stars flounder	
151	475		Red A 8.3 Grn J 42.4	Red A 8.7 Grn J 41.8	136	43	15	1.00	sand	<2	1	0	sand dollars crabs urchins	occasional small disarticulated scallop valves
152	476		Red B 9.7 Grn J 40.4	Red B 10.3 Grn J 39.4	109	42	16	1.00	sand	82	1	82	sand dollars urchins flounder	
153	478		Red B 10.9 Grn J 38.9	Red B 10.9 Grn J 39.5	96	42	16	1.00	sand	<2	1	0	sand dollars crabs sea stars	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
163	462		Red B 17.5 Grn I 42.4	Red B 17.4 Grn I 42.7	190	44	15	1.00	rock	<2	1	0		
164	429		Red B 17.4 Grn I 44.3	Red B 17.6 Grn I 43.3	75	44	17	1.25	sand	5	1	4	sand dollars flounder	12 - 15 yellowtail and plaice guts examined no scallops found
165	428		Red B 18.8 Grn I 39.0	Red B 19.0 Grn I 38.4	100	43	15	1.00	sand rock	7	1	7	sand dollars flounder	
166		30	Red B 19.5 Grn I 36.4	Red B 19.6 Grn I 35.8	100	44	15	1.00	sand	<2	1	0	sand dollars flounder	
167	424		Red B 19.6 Grn I 35.5	Red B 19.9 Grn I 34.7	90	43	16	1.00	sand	0	1	0	sand dollars brittle stars flounder	
168	416		Grn I 32.8 Pur A 63.4	Grn I 32.8 Pur A 63.4	160	43	19	1.25	sand	<2	1	0	sand dollars flounder crabs	a few Arctica shells
169	406		Grn I 30.1 Pur A 64.5	Grn H 29.7 Pur A 63.7	150	37	17	1.00		10	1	10	sun stars sea stars sea cucumber	a few Arctica shells
170	405		593X 14157 793Z 43799	593X 14156 793Z 43789	260	36	18	1.00	sand	0	1	0	sand dollars flounder	
171	457		593X 14149 793Z 43756	593X 14151 793Z 43754	314	36	17	1.00	shell	52	1	52	sea stars Arctica	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
181		33	593X 14128 793Z 43637	593X 14128 793Z 43630	270	40	16	1.00	shell rock	295	1	295	sea stars sea cucumbers clams	
182	421		593X 14128 793Z 43622	593X 14129 793Z 43627	320	41	16	1.00	sand rock	332	1	332	sea stars sand dollars	
183		34	593X 14130 793Z 43615	593X 14132 793Z 43610	320	41	17	1.25	sand shell	8	1	6	sand dollars sea stars	
184	430		Red B 17.4 Grn I 45.8	Red B 17.3 Grn 1 46.3	195	41	19	1.00	sand shell	19	1	13	sand dollars sea stars crabs	
185	431		Red B 17.0 Grn I 47.8	Red B 17.0 Grn I 47.7	325	40	17	1.00	sand	106	1	106	sand dollars sea stars	shells of Arctica scallops heavily encrusted with barnacles
186		35	Red B 17.9 Grn I 47.8	Red B 16.7 Grn J 30.5	270	41	19	1.25	sand	8	1	6	sand dollars	
187		36	593X 14118 793Z 43579	593X 14115 793Z 43581	175	40	20	1.25	shell rock	202	1	202	sea stars crabs	
188		37	593X 14114 793Z 43582	593X 14112 793Z 43585	175	40	20	1.25	rock gravel	632	1	506	sea stars crabs	heading for Lilly Canyon
189		38	593X 14106 793Z 43594	593X 14103 793Z 43597	175	38	22	1.50	shell rock	24	1	16	sea stars crabs	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
199		48	593X 14027 593Z 25111	593X 14026 593Z 25110	145	44	17	1.25	sand	<2	1	0	sand dollars clams sea cucumber	
200		49	593X 14024 793Z 43730	593X 14020 793Z 43734	165	41	20	1.25	rock	16	1	13	sea cucumbers sea stars	
201		50	593X 14020 793Z 25112	593X 14019 793Z 25112	165	39	18	1.00	rock	26	1	26	sea stars crabs	
202		51	593X 14016 793Z 43756	593X 14005 793Z 43763	165	37	19	1.00	shells sand	0	1	0	sand dollars crabs	
203		52	593X 14011 793Z 43768	593X 14008 793Z 43781	165-200	40	18	1.00	sand	0	1	0	brittle stars sand dollars crabs	
204		53	593X 14006 793Z 43781	593X 14003 793Z 43778	200	44	18	1.00	sand	0	1	0	brittle stars flounder sand dollars	
205		54	593Y 25122 793Z 43762	593Y 25124 793Z 43755	270	35	16	1.00	sand	0	1	0	sand dollars Arctica crabs	
206		55	593Y 25129 793Z 43735	593Y 25132 793Z 43727	270	34	20	1.25	sand	<2	1	0	sand dollars sea stars sea cucumbers	
207		56	593Y 25137 793Z 43715	593Y 25139 793Z 43707	270	32	18	1.00	sand rock	4	1	4	sea cucumbers sand dollars sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

D84

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
217		66	Red B 16.8 Grn J 30.7	Red B 16.7 Grn J 30.6	325	41	20	1.25	shell	39	1	31	sand dollars flounder clams	3 plaice guts examined, no scallops found
218	457		Red B 16.6 Grn J 30.0	Red B 16.4 Grn J 30.4	305	42	20	1.25	sand	8	1	6	sand dollars crabs flounder	
219	456		Red B 15.9 Grn J 31.4	Red B 15.7 Grn J 32.1	266	42	17	1.25	sand	<2	1	0	sand dollars	
220	455		Red B 14.6 Grn J 35.2	Red B 14.7 Grn J 35.2	150	42	20	1.25	sand	<2	1	0	sand dollars	
221	452		Red B 15.1 593X 14117	Grn J 35.1 593Y 25071	270	41	16	1.00	shell rock	76	1	76	crabs flounder	
222		67	Red B 14.7 Grn J 36.0	Red B 14.4 Grn J 36.6	270	42	16	1.00	sand rock	6	1	6	sand dollars	
223	451		Red B 14.2 Grn J 37.2	Red B 14.2 Grn J 37.5	170	42	17	1.25	rock	9	1	7	sea stars crabs	
224	439		Red B 14.1 Grn J 38.4	Red B 13.8 Grn J 39.1	270	41	18	1.00	rock	21	1	21	sea stars	few disarticulated scallop valves
225	440		Red B 12.9 Grn J 40.0	Red B 12.9 Grn J 40.1	340	41	18	1.00	rock	136	1	136	sea stars flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
235	515		Red B 5.2 Grn A 31.3	Red B 4.8 Grn A 35.2	208	40	18	1.00	rock	<2	1	0	sea cucumbers	
236	507		Red B 3.2 Grn A 39.7	Red B 3.4 Grn A 39.5	145	53	15	1.00	rock	<2	1	0	sea stars crabs	
237	490		Red B 4.9 Grn A 37.1	Red B 4.4 Grn A 36.0	50	39	19	1.00	rock	4	1	4	sea stars flounder	
238	494		Red B 2.5 Grn A 40.8	Red B 2.8 Grn A 40.7	157	37	17	1.00	rock	87	1	87	sea stars flounder	
239		69	Red B 2.9 Grn A 40.6	Red B 3.1 Grn A 40.5	157	38	17	1.00	rock	17	1	17	sea stars crabs flounder	
240	493		Red B 3.6 Grn A 40.4	Red B 4.2 Grn A 39.3	102	38	18	1.00	rock	33	1	33	sea stars flounder	
241	492		Red B 6.3 Grn A 35.7	Red B 6.5 Grn A 35.6	156	38	18	1.00	rock sand	9	1	9	sea stars	
242	447		Red B 7.1 Grn A 35.5	Red B 6.7 Grn A 36.3	282	37	17	1.00	rock	10	1	10		
243	496		Red B 4.0 Grn A 41.1	Red B 3.7 Grn B 41.5	290	37	16	1.00	rock	<2	1	0		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
253		70	593X 14070 593Y 25217	593X 14071 593Y 25220	312	37	17	1.00	rock	<2	1	0	sea stars flounder	
254	511		Red A 17.9 Grn B 37.5	Red A 18.1 Grn B 36.8	40	36	16	1.00	rock	0	1	0	sea stars	
255	510		Red A 19.7 Grn B 33.5	Red A 20.0 Grn B 33.0	120	42	17	1.25	rock	0	1	0		
256	509		Red A 23.2 Grn A 46.3	Red A 23.7 Grn A 45.9	115	40	15	1.00	rock	0	1	0		
257	506		593X 14086 593Y 25159	593X 14087 593Y 25159	320	40	18	1.25	rock	0	1	0		
258	508		593X 14094 593Y 25165	593X 14096 593Y 25162	10	42	15	1.00	rock	0	1	0		
259	512		593X 14106 593Y 25153	593X 14108 593Y 25150	10	42	15	1.00	rock	0	1	0		
260	514		593X 14123 593Y 25134	593X 14126 593Y 25128	75	50	20	1.25	rock	0	1	0	sea stars queen crabs	
261	516		593X 14138 593Y 25105	593X 14141 593Y 25101	5	39	18	1.00	rock	9	1	9	sea stars flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
271	585		593X 14155 593Y 25192	593X 14158 593Y 25191	353	49	17	1.00	rock	<2	1	0	flounder	
272	588		593X 14170 593Y 25188	593X 14167 593Y 25196	227	48	17	1.00	gravel	20	1	20	sea stars	
273	587		593X 14140 593Y 25261	593X 14140 593Y 25253	110	41	17	1.00	rock	<2	1	0	sea stars crabs flounder	
274	583		593X 14141 593Y 25233	593X 14137 593Y 25240	199	49	19	1.00	rock	0	1	0	sea stars flounder	
275	580		593X 14124 593Y 25261	593X 14123 593Y 25267	277	54	16	1.00	rock	0	1	0		
276	581		593X 14119 593Y 25291	593X 14121 593Y 25291	324	43	15	1.00	rock	<2	1	0	flounder crabs	
277	582		593X 14125 593Y 25302	593X 14122 593Y 25305	185	37	15	1.00	rock	<2	1	0	sea stars flounder crabs	
278	576		593X 14098 593Y 25238	593X 14095 593Y 25333	185	52	16	1.00	rock	<2	1	0	sand dollars flounder	
279	574		593X 14075 593Y 25360	593X 14075 593Y 25366	290	50	15	1.00	rock	<2	1	0		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
289	637		593X 14047 593Y 25508	593X 14048 593Y 25499	100	39	18		rock	128	1	128	sea stars flounder	
290		71	593X 14049 593Y 25494	593X 14050 593Y 25486	100	40	15	1.00		51	1	51		
291		72	593X 14050 593Y 25482	593X 14051 593Y 25474	100	40	17	1.25	rock	24	1	24	crabs sea stars flounder	
292	638		593X 14053 593Y 25462		330						1			fatal accident on on board rake & cable lost
293	638		593X 14056 593Y 25475	593X 14054 593Y 25482	250	43	15	1.00	rock	11	1	11	sea stars	
294	605		Red J 6.6 Grn D 40.6	Red J 7.3 Grn D 49.8	90	41	15	1.00	rock	<2	1	0	sea stars crabs	
295	604		Red J 10.4 Grn D 36.6	Red J 11.0 Grn D 35.8	80	38	15	1.00	rock	13	1	13	sea stars	
296	602		Red J 14.5 Grn D 30.6	Red J 15.2 Grn D 47.6	80	40	15	1.00	rock	7	1	7	sea stars	
297	601		Red J 11.4 Grn D 33.5	Red J 10.7 Grn D 34.4	260	38	16	1.00	rock	7	1	7	crabs flounder	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
307	592		Red J 12.3 Grn C 42.7	Red J 12.5 Grn C 42.0	40	43	15	1.00	rock	<2	1	0	sea stars	
308	590		Red J 14.4 Grn C 36.6	Red J 14.7 Grn C 35.7	50	45	15	1.00	rock	<2	1	0	sea stars crabs flounder	
309	657		Red J 16.5 Grn C 32.1	Red J 15.7 Grn C 33.2	250	42	16	1.00	sand	0	1	0	sand dollars sea stars flounder	
310	591		Red J 8.3 Grn C 45.4	Red J 7.3 Grn C 46.6	274	38	17	1.00	rock	7	1	7	sea stars flounder	
311	596		Red J 3.3 Grn D 33.4	Red J 3.4 Grn D 33.9	205	42	17	1.00	rock	2	1	2	sea stars crabs flounder	
312	656		Red J 3.3 Grn D 36.0	Red J 3.4 Grn D 36.5	198	40	17	1.00	rock	0	1	0	crabs sea stars	
313	597		Red J 3.1 Grn D 38.4	Red J 2.1 Grn D 39.0	318	40	16	1.00	sand rock	0	1	0	sea stars sand dollars urchins	
314	609		Red J 20.8 Grn D 42.9	Red J 21.4 Grn D 42.9	184	50	18	1.00	rock	0	1	0	sea stars basket stars flounder	
315	655		Red I 22.3 Grn D 43.5	Red I 21.3 Grn D 44.5	284	48	16	1.00	rock	0	1	0		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
325	653		Red I 15.7 Grn E 34.8	Red I 14.5 Grn E 35.5	305	50	17	1.00	rock	0	1	0	flounder	
326	610		Red I 12.1 Grn E 38.1	Red I 12.3 Grn E 38.4	208	51	15	1.00	rock	0	1	0		
327	612		Red I 12.4 Grn E 40.6	Red I 12.9 Grn E 41.5	245	49	17	1.00	rock	0	1	0	sea stars	
328	652		Red I 11.7 Grn E 42.4	Red I 11.5 Grn E 42.8	227	56	14	1.00	rock	0	1	0		
329	618		Red I 10.5 Grn E 43.8	Red I 10.3 Grn E 43.8	5	43	15	1.00	rock	<2	1	0	sea stars	
330	163		Red I 8.0 Grn E 44.2	Red I 7.7 Grn E 44.7	220	50	15	1.00	rock	< 2	1	0	sea stars	
331	617		Red I 6.9 Grn E 47.5	Red I 6.2 Grn E-F 30.0	310	44	15	1.00	rock	<2	1	0	sea stars	
332	614		Red I 2.2 Grn F 33.6	Red I 2.9 Grn F 33.9	230	52	15	1.00	rock	0	1	0		
333	615		593X 14050 593Y 25817	593X 14055 593Y 25814	20	46	15	1.00	rock	0	1	0		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
343		82	Red G 10.9 Grn C 46.1	Red G 10.2 Grn C 44.2	20	39	15	1.00	rock	24	1	24	sea stars flounder	
344		83	Red G 10.1 Grn C 44.1	Red G 10.0 Grn C 46.5	225	42	15	1.00	rock	31	1	31	sea stars	
345		84	Red G 9.5 Grn C 46.8	Red G 9.3 Grn C 44.4	45	45	15	1.00	rock	24	1	24	sea stars crabs flounder	
346		85	Red G 9.3 Grn C 43.1	Red G 8.9 Grn C 40.7	45	48	16	1.00	shell gravel	43	1	43	sea stars crabs	some disarticulated scallop valves
347		86	Red G 9.2 Grn C 39.5	Red G 10.8 Grn C 37.5	135	41	15	1.00	rock	24	1	24	crabs sea stars	some disarticulated scallop valve
348		87	Red G 10.1 Grn C 35.8	Red G 10.1 Grn C 37.8	306	41	17	1.00	rock	23	1	23	sea stars flounder	
349		88	Red G 9.4 Grn C 30.6	Red G 9.4 Grn C 33.1	237	45	17	1.00	rock	15	1	15	sea stars	
350		89	Red G 8.9 Grn D 41.4	Red G 8.7 Grn D 43.5	237	50	16	1.00	rock	11	1	11	sea stars	
351		90	Red G 8.2 Grn E 34.1	Red G 8.0 Grn E 35.7	237	54	16	1.00	rock	< 2	1	0	sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

D100

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
361		100	Red G 15.3 Grn G 34.2	Red G 14.1 Grn G 34.7	235	38	16	1.00	rock	45	1	45	sea stars crabs	
362		101	Red G 15.2 Grn G 35.8	Red G 15.3 Grn G 36.0	218	34	16	1.00	rock	15	1	15	sea stars flounder	
363		102	Red G 2.8 Grn G 46.3	Red G 2.0 Grn G 46.8	260	35	15	1.00	rock	< 2	1	0	sea stars	
364		103	Red G 1.4 Grn G 47.1	Red G 0.4 Grn G 47.6	265	33	16	1.00	rock	11	1	11	sea stars	
365		104	593X 14139 593Y 26284	593X 14139 593Y 26297	265	33	15	1.00	rock	16	1	16	sea stars sea cucumbers	
366		105	593X 14139 593Y 26303	593X 14140 593Y 26318	265	32	15	1.00	rock	2	1	2	sea cucumbers	
367		106	593X 14140 593Y 26325	593X 14140 593Y 26339	265	30	15	1.00	rock	< 2	1	0	sea cucumbers	
368		107	593X 14140 593Y 26343	593X 14142 593Y 26355	300	28	15	1.00	rock	< 2	1	0	sea stars crabs sea cucumbers	
369		108	593X 14142 593Y 26361	593X 14143 593Y 26373	290	28	15	1.00	rock	13	1	13	crabs sea stars flounder	40 lbs. giant scallops

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

D102

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
379		118	593X 14141 593Y 26435	593X 14145 593Y 26436	340	24	18	1.25	sand	818	1	654	sand dollars	33 lbs. giant scallops
380		119	593X 14141 593Y 26434	593X 14144 593Y 26437	340	24	20	1.25		552	1	442	flounder	9 lbs. giant scallops
381		120	593X 14144 593Y 26428	593X 14140 593Y 26424	175	24	20	1.25		516	1	413	flounder	40 lbs. giant scallops
382		121	593X 14142 593Y 26422	593X 14146 593Y 26426						912			sea cucumbers sea stars flounder	67 lbs. biant scallops
383		122	593X 14146 593Y 26426	593X 14142 593Y 26422						624			sea cucumbers sea stars flounder	48 lbs. giant scallops
384		123	593X 14139 593Y 26427	593X 14145 593Y 26437	340	23	25	1.50		480	1	320	sea cucumbers flounder	96 lbs. giant scallops
385		124	593X 14148 593Y 26444	593X 14149 593Y 26462	290	25	20	1.25	rock shell	120	1	96	sea cucumbers	72 lbs. giant scallop
386		125	593X 14149 593Y 26466	593X 14151 593Y 26490	290	25	24	1.50	rock shell	120	1	80	sea cucumbers flounder	48 lbs. giant scallops
387		126	593X 14152 593Y 26496	593X 14153 593Y 26519	290	25	22	1.50	rock shell	58	1	37	sea cucumbers sand dollars	72 lbs. giant scallops

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

D104

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
397		136	593X 14116 593Y 26511	593X 14120 593Y 26497	70	24	22	1.25	rock	0	1	0	sea cucumbers sea stars flounder	132 lbs. giant scallops
398		137	593X 14120 593Y 26496	593X 14113 593Y 26508	230	24	22	1.25	sand rock	0	1	0	sea cucumbers sea stars mussels	215 lbs. giant scallops
399		138	593X 14113 593Y 26508	593X 14119 593Y 26496	35	25	24	1.50		0	1	0		96 lbs. giant scallops
400		139	593X 14120 593Y 26495	593X 14115 593Y 26507	228	24	20	1.25	rock	0	1	0	sea cucumbers sea stars	192 lbs. giant scallops
401		140	593X 14114 593Y 26508	593X 14120 593Y 26492	50	24	29	1.75	rock	0	1	0	sea cucumbers sea stars	144 lbs. giant scallops
402		141	593X 14121 593Y 26493	593X 14116 593Y 26505	230	24	22	1.25	rock	0	1	0	sea cucumbers sea stars	160 lbs. giant scallops
403		142	593X 14115 593Y 26507	593X 14120 593Y 26495	45	24	25	1.50	rock	0	1	0	sea cucumbers sea stars	144 lbs. giant scallops
404		143	593X 14121 593Y 26494	593X 14126 593Y 26476	45	23	25	1.50	rock	0	1	0	sea cucumbers sea stars	160 lbs. giant scallops
405		144	593X 14140 593Y 26429		335	24	9	0.50	rock	312	1	624	sea cucumbers sea stars	24 lbs. giant scallops

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
415		154	593X 14145 593Y 26437	593X 14140 593Y 26447	225	25	25	1.50	rock	816	2	272	sea cucumbers sea stars	96 lbs. giant scallop
416		155	593X 14138 593Y 26449	593X 14134 593Y 26459	240	23	20	1.25	rock	0	2	0	sea cucumbers sea stars	1 rake inverted 72 lbs. giant scallops
417		156	593X 14128 593Y 26472	593X 14137 593Y 26458	55	22	24	1.50	rock	0	2	0	sea cucumbers sea stars	24 lbs. giant scallops
418		157	593X 14125 593Y 26474	593X 14122 593Y 26490	225	23	24	1.50	rock	0	2	0	sea cucumbers sea stars	72 lbs. giant scallops
419		158	593X 14121 593Y 26493	593X 14121 593X 26491	50	25	26	1.50	rock	0	2	0	sea cucumbers sea stars	60 lbs. giant scallops
420		159	593X 14120 593Y 26494	593X 14116 593Y 26514	250	24	25	1.50	rock	0	2	0	sea cucumbers sea stars	96 lbs. giant scallops
421		160	593X 14114 593Y 26526	593X 14117 593Y 26508	90	24	25	1.50	rock	0	2	0	sea cucumbers sea stars	96 lbs. giant scallops
422		161	593X 14117 593Y 26504	593X 14110 593Y 26520	250	24	25	1.50	rock	0	2	0	sea cucumbers sea stars	120 lbs. giant scallops
423		162	593X 14111 593Y 26522	593X 14117 593Y 26512	20	24	27	1.75	rock	0	2	0	sea cucumbers sea stars	96 lbs. giant scallops

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
433		172	593X 14136 593Y 26445	593X 14142 593Y 26439	20	23	20	1.50	rock	0	2	0	sea cucumbers sea stars	48 lbs. giant scallops
434		173	593X 14144 593Y 26436	593X 14140 593Y 26436	200	25	20	1.25	rock	984	2	394	sea cucumbers sea stars	72 lbs. giant scallops
435		174	593X 14140 593Y 26434	593X 14145 593Y 26436	335	25	21	1.25	rock	838	2	355	sea cucumbers sea stars	72 lbs. giant scallops
436		175	593X 14146 593Y 26437	593X 14140 593Y 26436	200	25	23	1.50	rock	960	2	320	sea cucumbers sea stars	72 lbs. giant scallops
437		176	593X 14140 593Y 26436	593X 14145 593Y 26436	30	25	25	1.50	rock	936	2	312	sea cucumbers sea stars	72 lbs. giant scallops
438		177	593X 14146 593Y 26437	593X 14140 593Y 26436	200	25	26	1.50	rock	864	2	288	sea cucumbers sea stars	96 lbs. giant scallops
439		178	593X 14140 593Y 26436	593X 14145 593Y 26437	360	25	24	1.50	rock	840	2	280	sea cucumbers sea stars	72 lbs. giant scallops

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
10		1	Red J 6.0 Grn C 43.5		225	55	15	1.00	rock	0	1	0		
11	155		Red J 1.8 Grn D 33.0	Red J 3.1 Grn D 31.6	110	51	17	1.25	rock	0	1	0	sea stars crabs	
12		2	Red J 16.9 Grn C 36.6		117	46	15	1.00	rock	0	1	0		
13	144		593X 14154 593Y 25226	593X 14157 593Y 25217	65	51	15	1.00	rock	0	1	0	sea stars urchins flounder	
14	142		593X 14168 593Y 25176	593X 14169 593Y 25169	95	54	19	1.00	rock	< 2	1	0	sea stars urchins crabs	
15	156		593X 14174 593Y 25147	593X 14175 593Y 25148	315	53	14	1.00	rock	0	1	0	sea stars crabs flounder	
16	151		593X 14184 593Y 25167	593X 14186 593Y 25159	40		18	1.25	rock	<2	1	0	sea stars queen crabs urchins	
17	154		593X 14195 593Y 25139	593X 14196 593Y 25134	75	72	17	1.25	rock	0	1	0	sea stars crabs	
18	146		593X 14197 593Y 25128	593X 14196 593Y 25129	153	68	16	1.00	rock	0	1	0	sea stars basket stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
28	27		Red B 13.1 Grn I 46.9	Red B 13.2 Grn I 47.0	154		15	1.00	rock	<2	1	0		
29	25		Red B 13.6 Grn I 48.0	Red B 13.8 Grn I 46.8	148		15	1.00	rock	<2	1	0		
30	28		Red B 14.2 Grn I 46.2	Red B 14.5 Grn I 45.2	50	40	17	1.00	rock	0	1	0	sea stars	
31	233		Red B 16.9 Grn I 37.3	Red B 17.0 Grn I 36.6	350	48	16	1.00	rock	<2	1	0	sea stars	
32	12		Red B 17.1 Grn I 36.0	Red B 17.1 Grn I 35.8	340	49	14	1.00	rock	0	1	0		
33	11		Red B 18.0 Grn I 33.0	Red B 18.1 Grn I 32.2	10	51	15	1.00	rock	<2	1	0	sea stars flounder	
34	15		Red B 19.6 Grn H 42.3	Red B 19.8 Grn H 41.3	100	48	16	1.00	rock	<2	1	0	sea stars flounder	
35	37		Grn H 36.4 Pur A 64.2	Grn H 36.9 Pur A 64.6	135	40	20	1.25	rock	3	1	2	sea stars crabs urchins	
36	47		Grn H 35.5 Pur A 65.5	Grn H 36.6 Pur A 65.2	315	44	16	1.00	rock	5	1	5	sea stars crabs urchins	

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
46	41		Grn I 30.1 Pur A 61.9	Grn H 47.1 Pur A 62.5	50	46	17	1.25	sand rock	4	1	3	sand dollars	
47	54		Grn H 41.5 Pur A 64.0	Grn H 41.6 Pur A 64.2	160	37	17	1.25	rock	3	1	2		
48	42		Grn H 43.0 Pur A 63.9	Grn H 42.8 Pur A 63.9	160	42	17	1.00	rock	2	1	2	sea stars	
49	30		Grn H 43.0 Pur A 64.0	Grn H 43.6 Pur A 63.9	160	43	15	1.00	sand	<2	1	0	sand dollars flounder	
50	34		Grn H 47.0 Pur A 63.2	Grn H 48.0 Pur A 63.0	225	46	17	1.00	sand	<2	1	0	sand dollars sea stars	
51	40		Grn I 34.6 Pur A 61.3	Grn I 33.7 Pur A 61.5	115	46	17	1.00	sand rock	21	1	21	urchins sand dollars sea stars	57 scallop meats = 5 lbs. or 11.4 meats/lb.
52	53		593X 14176 793Z 43684	593X 14180 793Z 43692	32	44	15	1.00	sand	< 2	1	0	sand dollars urchins sea stars	
53		7	593X 14188 793Z 43708		32	45	15	1.00	rock	25	1	25		
54	44		Grn H 42.1 Pur A 65.2	Grn H 41.2 Pur A 65.6	40	45	16	1.00	sand	<2	1	0	sand dollars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
64	95		593X 14183 793Z 43799	593X 14183 793Z 43808	125	39	15	1.00	sand	2	1	0	sand dollars sea cucumbers	
65		11	593X 14180 793Z 43830			38	15	1.00	rock	0	1	0	sea stars	
66	84		593X 14176 793Z 43894	593X 14176 793Z 43901	130	37	16	1.00	rock	28	1	28	basket stars	scallops heavily encrusted with barnacles
67		12	593X 14168 793Z 43894		180	36	20	1.25	rock	12	1	10		
68		13	593X 14162 793Z 43894		180	33	22	1.50	sand	0	1	0	sand dollars	
69		14	593X 14162 793Z 43908		55	33	15	1.00	sand	0	1	0	sand dollars	
70		15	593X 14174 793Z 43960		90	34	20	1.25	sand	0	1	0	sand dollars	
71	97		593X 14175 793Z 43967	593X 14177 793Z 43978	105	33	15	1.00	sand	2	1	0	sand dollars sea stars	
72	100		593X 14181 793Z 44074	593X 14184 793Z 44084	12	36	17	1.25	sand	0	1	0	sand dollars crabs	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
82	87		Grn F 45.1 Pur B 54.8	Grn F 44.6 Pur B 55.3	105	42	18	1.25	sand	0	1	0	sand dollars	
83	71		Grn F 41.5 Pur B 58.6	Grn F 40.5 Pur B 59.1	20	45	19	1.25	sand	0	1	0	sand dollars flounder clams	
84	91		593X 14298 793Z 44363	593X 14299 793Z 44358	308	48	17	1.25	rock	100	1	80		shell height - meat weight sample taken from this set
85	64		Grn F 37.8 Pur B 61.2	Grn F 37.2 Pur B 60.1	78	41	14	1.00	sand gravel	<2	1	0	sand dollars flounder	
86		20	Grn F 35.5 Pur B 61.6	Grn F 34.9 Pur B 62.1	100		15	1.00	sand	0	1	0	sand dollars	
87		21	Grn F 33.1 Pur B 63.5	Grn F 32.6 Pur B 64.1	78	47	17	1.25	sand gravel	105	1	84	sand dollars	
88		22	Grn F 32.2 Pur B 64.4	Grn F 31.6 Pur B 65.0	000	48	13	1.00	rock	88	1	88		
89		23	Grn F 32.7 Pur B 64.2	Grn F 32.1 Pur B 64.8	90	49	17	1.00	rock	160	1	160		
90	55		Grn F 30.4 Pur B 66.4	Grn F 30.2 Pur B 66.3	300	50	18	1.00	sand	0	1	0	sand dollars	

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
100	239		Red B 10.5 Grn E 36.6	Red B 9.8 Grn E 35.5	23	60	18	1.00	sand rock	<2	1	0	basket stars brittle stars sand dollars	
101	259		Red B 8.3 Grn E 32.8	Red B 7.7 Grn E 32.0	1	63	17	1.00	gravel	0	1	0	brittle stars sand dollars	
102	271		Red B 5.8 Pur B 74.7	Red B 5.1 Pur B 75.6	350	74	18	1.25	rock sand	<2	1	0	basket stars sand dollars	
103	276		Red B 4.7 Pur B 76.0	Red B 3.7 Pur B 77.1	45	78	19	1.25	rock	0	1	0	flounder	
104	241		Red A 23.4 Pur C 52.6	Red A 23.3 Pur C 52.4	300	71	18	1.25	rock	0	1	0	flounder	
105	249		Red A 23.4 Pur B-C 50.0	Red A 23.3 Pur B 79.8	285	92	17	1.25	rock	0	1	0	flounder	
106	258		Red B 3.6 Pur B 70.2	Red B 2.8 Pur B 69.1		68	20	1.00	sand gravel	0	1	0	basket stars urchins sea stars	
107	254													rake inverted set repeated
108	254		Red B 10.0 Pur B 64.1	Red B 10.1 Pur B 64.2	142	78	15	1.00			1			

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
118	242		Grn G 32.1 Pur A 72.1	Grn G 31.4 Pur A 72.3	340	77	17	1.25	rock	<2	1	0		
119	225		Grn F 47.7 Pur A 72.0	Grn F 47.6 Pur A 71.9	295	77	15	1.00	rock	<2	1	0	basket stars	
120	229		Grn F 30.8 Pur A 70.8	Grn F 32.1 Pur A 70.1		65	21	1.50	rock	0	1	0		
121	215		Grn G 35.3 Pur A 68.9	Grn G 35.7 Pur A 68.0	270	61	17	1.25	rock	0	1	0		
122	232		Grn G 42.3 Pur A 63.6	Grn G 42.4 Pur A 63.4	280	60	17	1.00	rock gravel	< 2	1	0		
123	222		Grn G 44.7 Pur A 62.1	Grn G 43.5 Pur A 62.4	22	67	14	1.00	rock	0	1	0	sea stars crabs flounder	
124	211													rake inverted set repeated
125	211													rake inverted set repeated
126	211		Grn B 42.2 Pur A 62.8	Grn G 41.2 Pur A 63.0	355	73	15	1.00	rock	<2	1	0		

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
136	191		Grn E 30.1 Pur B 56.8	Grn E 31.3 Pur B 56.8	223	80	17	1.00	rock	0	1	0	crabs sea stars basket stars	
137	196		Grn E 35.1 Pur B 52.8	Grn E 35.1 Pur B 53.1	135	84	12	1.00	rock	0	1	0		
138	184		Grn E 39.1 Pur A 78.7	Grn E 40.0 Pur A 78.1	190	100	17	1.25	rock	0	1	0	flounder	
139	201		Grn E 47.6 Pur A 71.8	Grn F 30.7 Pur A 71.1	245	99	18	1.00	rock	0	1	0	basket stars flounder	
140	217		Grn F 33.1 Pur A 73.2	Grn F 34.4 Pur A 72.4	235	94	20	1.00	rock	0	1	0	queen crabs basket stars	
141	223		Grn F 45.0 Pur A 66.9	Grn F 45.3 Pur A 66.5	290	96	19	1.00	rock	0	1	0	basket stars flounder	
142	178		Grn G 31.6 Pur A 62.6	Grn G 31.3 Pur A 62.5	300	85	18	1.25	rock	0	1	0		
143	173		Grn G 34.4 Pur A 60.0	Grn G 33.0 Pur A 60.6	85	85	17	1.25	rock	0	1	0		
144	174		Grn F 42.9 Pur A 65.2	Grn F 41.8 Pur A 66.0	30	90	18	1.25	rock	0	1	0		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
154	479		Red B 10.5 Grn J 40.9	Red B 11.0 Grn J 39.9	102	42	16	1.00	sand rock	18	1	18	sand dollars urchins flounder	
155	480		Red B 12.7 Grn J 36.5	Red B 12.8 Grn J 36.6	161	43	18	1.00	sand rock	22	1	22	sand dollars sea urchins flounder	
156	458		Red B 13.0 Grn J 36.9	Red B 13.4 Grn J 35.8	75	42	18	1.00	rock	0	1	0	sea stars flounder	
157	459		Red B 14.2 Grn J 33.5	Red B 14.5 Grn J 32.6	85	43	16	1.00	sand rock	2	1	2	sand dollars urchins flounder	
158	461		Red B 16.0 Grn I 46.4	Red B 16.2 Grn I 45.6	75	42	14	1.00	rock	102	1	102	sea stars flounder crabs	
159		28	Red B 16.3 Grn I 45.4	Red B 16.4 Grn I 45.5	170	42	16	1.00	rock	4	1	4		
160		29	Red B 16.9 Grn I 43.7	Red B 17.0 Grn I 43.3	350	43	15	1.00	rock	<2	1	0		
161	463		Red B 16.9 Grn I 43.7	Red B 17.0 Grn I 43.8	155	43	16	1.00	sand rock	10	1	10	sand dollars	
162	460		Red B 17.0 Grn I 43.7	Red B17.2 Grn I 43.0	70	43	15	1.00	rock	<2	1	0	sea stars	

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TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
172		31	593X 14152 793Z 43752	593X 14153 793Z 43750	315	38	17	1.00	shell	25	1	25	sea stars	½ bushel of scallops taken for meats
173	413		Grn I 34.6 Pur A 62.4	Grn I 35.1 Pur A 63.4	275	37	17	1.00	sand	16	1	16	sand dollars flounder	
174	417		593X 14151 793Z 43695	593X 14148 793Z 43694	180	40	15	1.00	rock sand	17	1	17	sand dollars flounder	scallops heavily encrusted with barnacles
175	418		593X 14143 793Z 43694	593X 14144 793Z 43687	300	38	17	1.25	shell	<2	1	0	crabs flounder	
176	423		593X 14147 793Z 43658	593X 14145 793Z 43649	255	41	15	1.00	rock	25	1	25	flounder	
177	422		593X 14141 793Z 43638	593X 14139 793Z 43643	140	42	17	1.25	sand	28	1	22	sand dollars sea stars urchins	
178	419		593X 14136 793Z 43661	593X 14134 793Z 43657	200	49	14	1.00	shell	115	1	115	crab flounder	shell height-meat wt sample taken from this set
179		32	593X 14132 793Z 43654	593Y 14129 793Z 43650	203	40	18	1.25	shell rock	183	1	146	sea stars sea cucumber flounder	
180	420		593X 14127 793Z 43649	593X 14128 793Z 43643	300	40	18	1.25	gravel	81	1	81	sea stars sea cucumbers urchins	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
190		39	593X 14097 793Z 25074	593X 14094 793Z 25075	175	36	24	1.50	rock gravel	62	1	41	sand dollars sea cucumbers sea stars	
191		40	593X 14088 793Z 43618	593X 14085 793Z 43622	175	35	22	1.50	rock	10	1	7	sea cucumbers sea stars	large scallops
192		41	593X 14079 593Y 25083	593X 14077 593Y 25084	170	34	17	1.00	shell rock	24	1	24	basket stars sea cucumbers flounder	
193		42	593X 14076 593Y 25084	593X 14074 593Y 25085	170	34	15	1.00	rock shell	17	1	17	sea stars crabs sea cucumbers	3 plaice guts examined and kept scallops found
194		43	593X 14066 593Y 25090	593X 14064 593Y 25091	180	32	17	1.25	shells	19	1	15	sea cucumbers sea stars crabs	3 plaice guts examined, no scallops found
195		44	593X 14055 593Y 25096	593X 14053 593Y 25097	170	30	16	1.00	rock	<2	1	0	sea cucumbers sea stars	
196		45	593X 14045 593Y 25102	593X 14043 593Y 25103	170	31	16	1.00	sand	<2	1	0	sand dollars crabs, sea stars sea cucumbers	12 plaice guts contained caplin, examined 3 yellowtail, no scallops found
197		46	593X 14034 593Y 25108	593X 14032 593Y 25109	170	36	16	1.00	sand shell	<2	1	0	sand dollars crabs, clams	
198		47	593X 14031 593Y 25109	593X 14029 593Y 25111	170	41	16	1.00	shell	<2	1	0	sea cucumbers crab, urchin clams	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
208		57	593Y 25147 793Z 43669	593Y 25148 793Z 43671	270	30	25	1.75	shell rock	9	1	5	sea stars	
209		58	Red B 16.5 Grn J 38.8	Red B 16.4 Grn J 38.5	350	32	16	1.00	shells sand	0	1	0	sand dollars	
210		59	Red B 16.7 Grn J 31.5	Red B 16.6 Grn J 31.5	305	40	17	1.00	shell gravel	429	1	429	sea stars	
211		60	Red B 16.5 Grn J 31.7	Red B 16.4 Grn J 32.6	235	40	18	1.00	shells	410	1	410	sea stars flounder	
212		61	593X 14107 793Z 43560	593X 14105 793Z 43566	170	39	18	1.00	gravel	39	1	39	sea stars flounder	
213		62	Red B 16.4 Grn J 33.2	Red B 16.6 Grn J 32.4	90	40	17	1.00	rock	44	1	44	sea stars crabs	
214		63	Red B 17.1 Grn J 30.9	Red B 17.3 Grn J 30.1	90	39	16	1.00	sand rock	79	1	79	sand dollars crabs sea cucumbers	
215		64	Red B 17.3 Grn I 48.0	Red B 17.1 Grn J 30.4	285	39	17	1.00	gravel	259	1	259	sea stars crabs	
216		65	Red B 17.0 Grn J 30.6	Red B 16.9 Grn J 30.6	310	40	18	1.25	shells rock	513	1	410	crabs	

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
226		68	Red B 12.9 Grn J 40.7	Red B 12.8 Grn J 40.6	340	41	17	1.00	rock	108	1	108	sea stars flounder	
227	450		Red B 12.6 Grn J 40.4	Red B 13.0 Grn J 39.6	20	41	18	1.00	rock	33	1	33	sea stars flounder	
228	454		Red B 13.8 Grn J 36.6	Red B 13.3 Grn J 37.2	272	42	18	1.00	rock sand	<2	1	0	sand dollars	
229	453		Red B 11.6 Grn J 40.0	Red B 11.8 Grn J 41.1	270	41	17	1.00	sand rock	23	1	23	sand dollars flounder	
230	485		593X 14119 793Z 43407	593X 14121 793Z 43405	350	41	17	1.00	rock	20	1	20	flounder sea stars	
231	481		Red B 9.8 Grn J 43.9	Red B 9.5 Grn J 44.1	300	41	21	1.25	rock	8	1	6		
232	482		Red B 8.9 Grn J 45.4	Red B 9.0 Grn J 45.0	355	41	17	1.25	rock	117	1	94	sea stars flounder	
233	477		Red B 9.2 Grn J 44.3	Red B 9.0 Grn J 44.7	305	45	19	1.25	sand rock	<2	1	0	sand dollars crabs urchins	
234	514		Red B 6.8 Grn J 47.3	Red B 6.2 Grn J 47.9	210	41	15	1.00	rock	0	1	0		

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
244	495		Red B 1.3 Grn B 30.1	Red B 0.8 Grn B 30.9	240	37	17	1.25	rock	<2	1	0		
245	559		Red A 21.7 Grn B 37.6	Red A 21.2 Grn B 38.3	255	36	13	1.00	rock	<2	1	0	sea stars	
246	558		Red A 19.3 Grn B 41.8	Red A 19.1 Grn B 41.9	330	37	8		rock	0	1	0		
247	557		Red A 17.8 Grn B 43.0	Red A 17.9 Grn B 42.5	25	37	17	1.25	sand rock	0	1	0	sand dollars	
248	500		Red A 20.2 Grn B 38.1	Red A 20.4 Grn B 37.5	50	38	16	1.00	rock	0	1	0	sea stars	
249	502		Red A 21.3 Grn B 35.0	Red A 21.9 Grn B 33.9	84	39	20	1.25	rock	4	1	3	sea stars flounder	
250	505		593X 14068 593Y 25183	593X 14070 593Y 25183	322	38	18	1.00	rock	19	1	19	sea stars flounder	
251	504		593X 14075 593Y 25187	593X 14074 593Y 25192	269	39	17	1.00	rock	0	1	0	sea stars	
252	503		593X 14067 593Y 25212	593X 14069 593Y 25213	312	35	18	1.00	rock	7	1	7	flounder	

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
262	589		593X 14148 593Y 25095	593X 14146 593Y 25098	264	40	18	1.00	rock	44	1	4	sun stars sea stars queen crabs	
263	518		593X 14132 593Y 25138	593X 14131 593Y 25142	287	43	18	1.00	rock	0	1	0	sea stars flounder crabs	
264	533		593X 14129 593Y 25156	593X 14133 593Y 25152	22	44	17	1.00	rock	0	1	0	sea stars flounder	
265	527		593X 14148 593Y 25134	593X 14150 593Y 25128	53	45	20	1.25	sand rock	0	1	0	sand dollars flounder	
266	525		593X 14168 593Y 25091	593X 14170 593Y 25090	310	45	17	1.25	rock	0	1	0		
267	526		593X 14173 593Y 25103	593X 14171 593Y 25107	230	43	17	1.25	rock	0	1	0	sea stars	
268	528		593X 14159 593Y 25131	593X 14161 593Y 25128	360	44	17	1.25	rock	0	1	0	sea stars	
269	529		593X 14171 593Y 25124	593X 14170 593Y 25130	270	45	22	1.25	rock	<2	1	0	sea stars flounder	
270	586		593X 14165 593Y 25153	593X 14163 593Y 25159	270	44	17	1.25	rock	<2	1	0	sea stars basket stars flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
280	575		593X 14073 593Y 25397	593X 14071 593Y 25395	150	57	15	1.00	rock	12	1	12	sea stars flounder	
281	572		593X 14059 593Y 25388	593X 14058 593Y 25386	250	47	17	1.25	rock	0	1	0	flounder	
282	570		593X 14047 593Y 25433	593X 14045 593Y 25440	245	49	17	1.00	rock	0	1	0		
283	568		593X 14037 593Y 25459	593X 14036 593Y 25456	143	47	16	1.00	rock	0	1	0	flounder	
284	567		593X 14030 593Y 25446	593X 14027 593Y 25451	218	47	16	1.00	rock	0	1	0	sea stars	
285	565		593X 14011 593Y 25481	593X 14010 593Y 25488	272	47	16	1.00	rock	0	1	0		
286	644		593X 14011 593Y 25531	593X 14014 593Y 25530	350	45	17	1.00	rock	<2	1	0	sea stars flounder	
287	640		593X 14022 593Y 25530	593X 14027 593Y 25521	43	43	16		sand	0	1	0	sand dollars sea stars	
288	639		593X 14041 593Y 25490	593X 14043 593Y 25491	320	43	16		rock	0	1	0		

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
298	659		Red J 8.8 Grn D 36.8	Red J 8.4 Grn D 36.8	358	39	17	1.00	rock	27	1	27	sea stars flounder	
299	600		Red J 7.3 Grn D 37.1	Red J 6.6 Grn D 38.1	247	37	18	1.00	sand	0	1	0	sand dollars crabs flounder	
300	603		Red J 4.8 Grn D 40.9	Red J 3.9 Grn D 40.8	350	38	17	1.00	rock	6	1	6	sea stars crabs	
301	599		Red J 1.5 Grn D 41.3	Red J 2.4 Grn D 40.3	107	39	16	1.00	rock	11	1	11	sea stars crabs	
302	598		Red J 7.1 Grn D 35.8	Red J 7.7 Grn D 34.8	111	39	16	1.00	rock	< 2	1	0	sea stars flounder crabs	
303	658		Red J 10.5 Red C 47.6	Red J 12.3 Red C 47.5	360	42	15	1.00	rock	< 2	1	0		
304	594		Red J 11.7 Grn C 47.4	Red J 11.0 Grn C 47.7	335	40	15	1.00	rock	0	1	0		
305	595		Red J 8.1 Grn D 30.9	Red J 8.8 Grn D 47.8	100	41	15	1.00	rock	15	1	15	crabs sea stars	
306	593		Red J 14.8 Grn C 41.8	Red J 14.5 Grn C 42.1	325	42	15	1.00	rock	0	1	0	sea stars crabs	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
316	654		Red I 17.1 Grn E 31.3	Red I 17.6 Grn E 31.3	185	53	15	1.00	sand	0	1	0	sand dollars brittle stars crabs	
317	608		Red I 19.3 Grn E 31.3	Red I 20.0 Grn E 30.8	160	42	15	1.00	rock	0	1	0	flounder crabs sea urchins	
318	607		Red I 21.0 Grn E 30.3	Red I 21.5 Grn E 30.1	160	40	10	0.75	rock	<2	1	0	crabs sea stars	
319	606		Red J 30.2 Grn D 46.7	Red J 30.7 Grn D 46.6	185	38	15	1.00	rock	<2	1	0	sea stars crabs	
320	622		Red J 1.6 Grn D 47.0	Red J 1.0 Grn D 47.8	260	36	20	1.25	rock	11	1	9	sea stars flounder	a plaice stomach sample taken
321	623		Red I 20.8 Grn E 34.9	Red I 20.6 Grn E 34.8	10	38	15	1.00	rock	18	1	18	sea stars	
322	621		Red I 19.1 Grn E 35.0	Red I 18.5 Grn E 35.7	265	39	13	0.75	rock	<2	1	0	sea stars crabs	
323	620		Red I 16.6 Grn E 38.0	Red I 17.2 Grn E 37.2	70	41	17	1.00	rock	<2	1	0	sea stars flounder	
324	611		Red I 16.0 Grn E 36.5	Red I 16.0 Grn E 36.0	32	44	16	1.00	rock	<2	1	0	sea stars crabs flounder	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW		DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
			START	END										
334		73	Red H 5.9 Grn D 43.6	Red H 6.0 Grn D 42.0	45	42	15	1.00	rock	< 2	1	0	sea stars flounder crabs	off Cape St. Mary's
335		74	Red H 6.0 Grn D 41.0	Red H 6.0 Grn D 39.8	45	36	15	1.00	rock	< 2	1	0	sea stars crabs	
336		75	Red H 6.1 Grn D 38.2	Red H 6.0 Grn D 36.7	45	39	15	1.00	rock	< 2	1	0	crabs sea stars	
337		76	Red H 5.7 Grn D 36.0	Red H 4.4 Grn D 35.9	355	35	15	1.00	rock	< 2	1	0	sea stars crabs	
338		77	Red H 2.8 Grn D 36.0	Red H 1.2 Grn D 36.0	355	37	16	1.00	rock	< 2	1	0	crabs sea stars	
339		78	Red G 20.5 Grn D 35.9	Red G 18.7 Grn D 36.0	355	33	15	1.00	rock	2	1	2	sea stars crabs	
340		79	Red G 18.8 Grn D 36.0	Red G 16.5 Grn D 35.2	360	37	15	1.00	rock	< 2	1	0	sea stars crabs	
341		80	Red G 16.0 Grn D 34.6	Red G 15.0 Grn D 33.3	10	38	15	1.00	rock	< 2	1	0	sea stars	
342		81	Red G 13.7 Grn D 30.9	Red G 13.1 Grn D 47.7	20	34	15	1.00	rock	0	1	0	sea stars	

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
352		91												rake inverted set abandoned
353		92	Red G 7.5 Grn F 34.6	Red G 7.1 Grn F 35.7	237	75	15	1.00	rock	0	1	0	basket stars	
354		93	Red G 15.0 Grn F 43.7	Red G 15.5 Grn F 43.7	210	48	15	1.00	rock	0	1	0	sea stars	Green Bank
355		94												rake inverted set abandoned
356		95	Red G 16.2 Grn F 46.4	Red G 16.9 Grn F 46.6	210	47	15	1.00	rock	10	1	10	brittle stars sea stars flounder	
357		96	Red G 17.1 Grn F 46.8	Red G 16.8 Grn F 47.2	225	41	15	1.00	sand	0	1	0	brittle stars sand dollars	
358		97												rake inverted set repeated
359		98	Red G 17.0 Grn G 30.7	Red G 17.1 Grn G 31.3	225	36	15	1.00	rock	0	1	0	urchins flounder crabs	
360		99												rake inverted set abandoned

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
370		109	593X 14144 593Y 26378	593X 14144 593Y 26389	270	20	15	1.00	rock	<2	1	0	sea stars	25 lbs. giant scallops
371		110	593X 14145 593Y 26395	593X 14146 593Y 26408	280	25	15	1.00	rock	37	1	37	sea stars sea urchins	10 lbs. giant scallops
372		111	593X 14147 593Y 26412	593X 14148 593Y 26428	280	27	20	1.25	rock	426	1	341	sea stars crabs	28 lbs. giant scallops
373		112	593X 14145 593Y 26433	593X 14141 593Y 26434	220	25	17	1.25	rock	450	1	360	sea cucumbers flounder	66 lbs. giant scallops
374		113	593X 14140 593Y 26436	593X 14145 593Y 26435	30	25	16	1.00	rock	509	1	509	sea cucumbers crab	57 lbs. giant scallops
375		114	593X 14145 593Y 26437	593X 14141 593Y 26435	180	25	17	1.25	rock	1092	1	874	sea cucumbers sea stars flounder	81 lbs. giant scallops
376		115	593X 14139 593Y 26438	593X 14144 593Y 26436	10	25	22	1.50	rock	110	1	73	sea cucumbers sea stars	27 lbs. giant scallops
377		116	593X 14146 593Y 26435	593X 14141 593Y 26436	200	26	15	1.00	rock shell	660	1	660	sea cucumbers	71 lbs. giant scallops
378		117	593X 14142 593Y 26436		350	25	5	1.00	sand		2		sand dollars	a gear selection tow

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
388		127	593X 14153 593Y 26522	593X 14153 593Y 26522	225	25	20	1.25	shell rock	0	1	0	sea cucumbers	24 lbs. giant scallops
389		128	593X 14153 593Y 26522	593X 14144 593Y 26518	135	25	20	1.25	rock	0	1	0	sea cucumbers	48 lbs. giant scallops
390		129	593X 14143 593Y 26518	593X 14140 593Y 26523	225	24	20	1.25	rock	84	1	67	sea cucumbers sea stars	24 lbs. giant scallops
391		130	593X 14140 593Y 26523	593X 14135 593Y 26532	225	24	25	1.50	rock	0	1	0		
392		131	593X 14131 593Y 26515	593X 14129 593Y 26498	150	23	20	1.25	rock	0	1	0	sea cucumbers sea stars	24 lbs. giant scallops
393		132	593X 14128 593Y 26496	593X 14122 593Y 26503	220	24	22	1.50	rock	24	1	16	sea cucumbers	96 lbs. giant
394		133	593X 14121 593Y 26505	593X 14121 593Y 26505	225	24	20	1.25	rock	0	1	0	sea cucumbers	144 lbs. giant scallops
395		134	593X 14116 593Y 26513	593X 14116 593Y 26513	70	24	25	1.50	rock	0	1	0	sea cucumbers sea stars	192 lbs. giant scallops
396		135	593X 14120 593Y 26496	593X 14116 593Y 26512	240	24	25	1.50	rock	0	1	0	sea cucumbers sea stars	108 lbs. giant scallops

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1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
406		145	593X 14143 593Y 26434		180	25	26	1.50	rock	696	1	464	sea cucumbers sea stars	70 lbs. giant scallops
407		146	593X 14146 593Y 26439	593X 14142 593Y 26430	180	24	20		rock	528	1		sea cucumbers sea stars	96 lbs. giant scallops
408		147	593X 14142 593Y 26435	593X 14143 593Y 26435	350	24	5				2			selectivity tow
409		148	593X 14144 593Y 26436	593X 14140 593Y 26436	200	25	15	1.00	rock sand	564	1	564	sea cucumbers sea stars sand dollars	24 lbs. giant scallops
410		149	593X 14142 593Y 26436	593X 14143 593Y 26436	20	25	30	2.00	rock	576	1	288	sea cucumbers	96 lbs. giant scallops
411		150	593X 14141 593Y 26435	593X 14145 593Y 26436	0	24	17	1.25	rock	384	1	307	sea cucumbers sea stars	48 lbs. giant scallops
412		151	593X 14146 593Y 26436	593X 14143 593Y 26437	180	26	20	1.25	rock	504	1	403	sea cucumbers sea stars	96 lbs. giant scallops
413		152	593X 14143 593Y 26434	593X 14144 593Y 26436	160	25	30	1.75	rock	480	1	274	sea cucumbers sea stars	
414		153	593X 14144 593Y 26435	593X 14143 593Y 26435	210	26	25	1.50	rock	888	2	296	sea cucumbers sea stars	120 lbs. giant scallops

1982 GRAND BANKS SCALLOP SURVEY "M.V. CHARLOTTE & RICKY"

TOW NUMBER	STATION NUMBER	FISHING TRIAL NUMBER	LOCATION OF TOW START	LOCATION OF TOW END	DIRECTION OF TOW (°MAGNETIC)	MEAN DEPTH OF WATER (FATHOMS)	TOW DURATION (MINUTES)	APPROXIMATE TOW DISTANCE (MILES)	BOTTOM TYPE	TOTAL SCALLOP CATCH (ROUND WEIGHT IN POUNDS)	NUMBER OF RAKES TOWED	SCALLOP CATCH (ROUND WEIGHT IN POUNDS) PER RAKE PER MILE	BY CATCH	COMMENTS
424		163	593X 14118 593Y 26508	593X 14123 593Y 26487	85	24	27	1.75	rock	0	2	0	sea cucumbers sea stars	400 lbs. giant scallops
425		164	593X 14123 593Y 26486		250	24	30	1.75	rock	0	2	0	sea cucumbers sea stars	456 lbs. giant scallops
426		165	593X 14119 593Y 26511	593X 14122 593Y 26491	90	24	25	1.50	rock	0	2	0	sea cucumbers	408 lbs. giant scallops
427		166	593X 14122 593Y 26491	593X 14118 593Y 26511	240	24	26	1.50	rock	0	2	0	sea cucumbers	360 lbs. giant scallops
428		167	593X 14118 593Y 26510	593X 14122 593Y 26491	90	24	25	1.50	rock	0	2	0	sea cucumbers	408 lbs. giant scallops
429		168	593X 14121 593Y 26491	593X 14118 593Y 26509	240	24	25	1.50	rock	0	2	0	sea cucumbers	168 lbs. giant scallops
430		169	593X 14118 593Y 26509	593X 14123 593Y 26491	60	24	25	1.50	rock	0	2	0	sea cucumbers	432 lbs. giant scallops
431		170	593X 14123 593Y 26489	593X 14119 593Y 26508	260	24	25	1.50	rock	0	2	0	sea cucumbers	264 lbs. giant scallops
432		171	593X 14119 593Y 26510	593X 14123 593Y 26488	90	24	28	1.75	rock	0	2	0	sea cucumbers	384 lbs. giant scallops